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A Review of the Hardware, Iron and Metal Trades.

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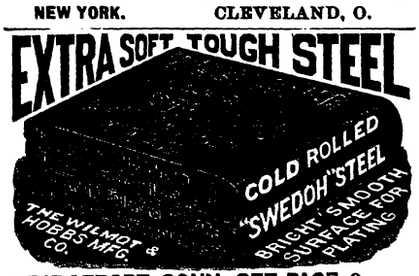

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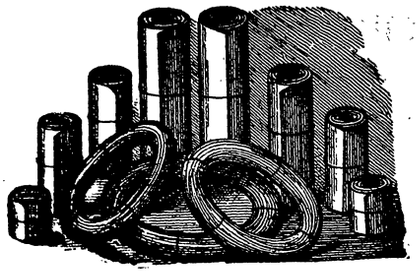

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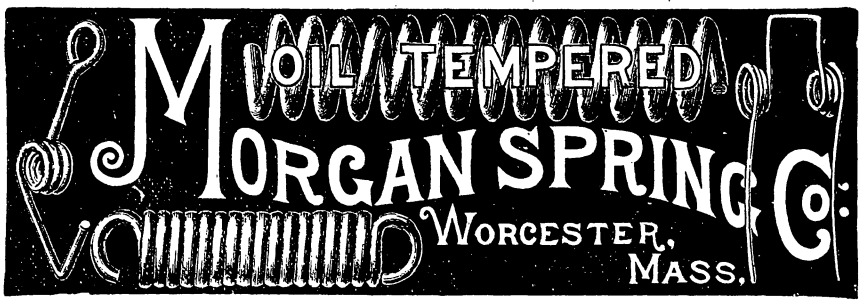

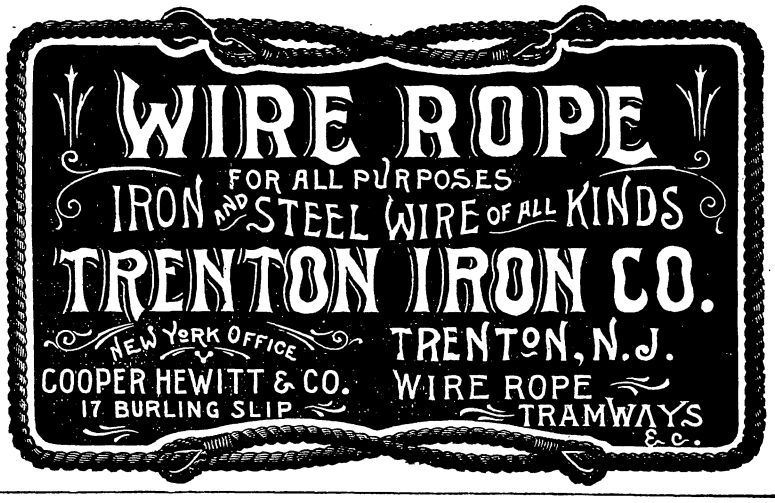

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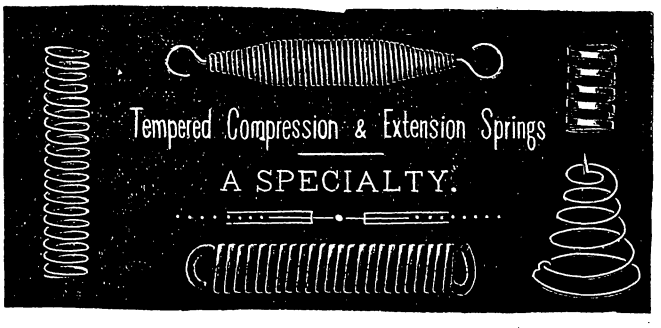

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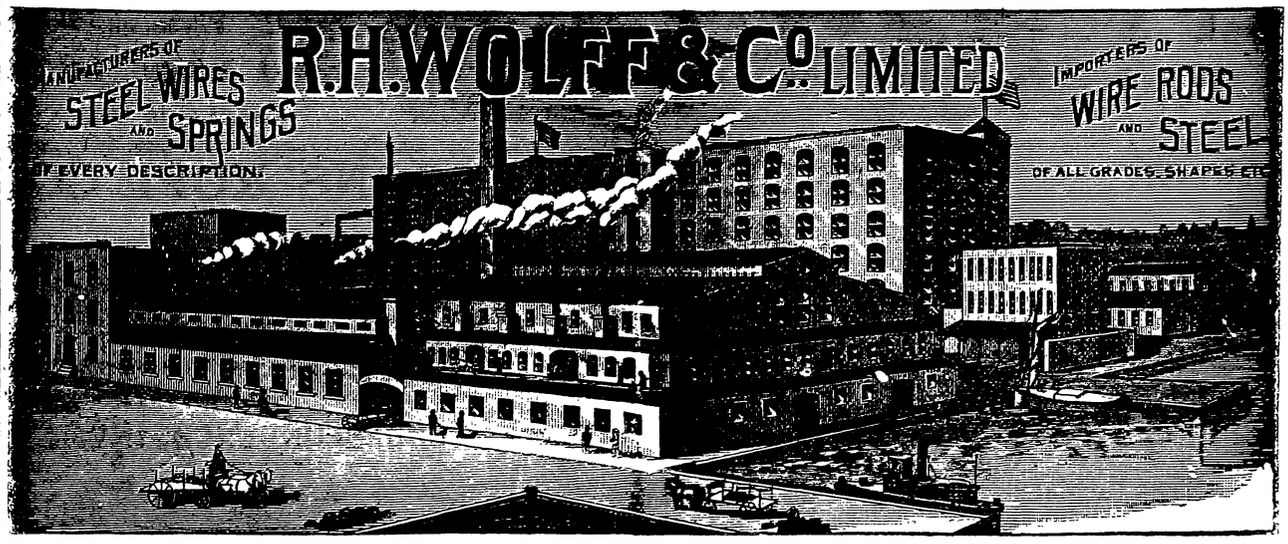

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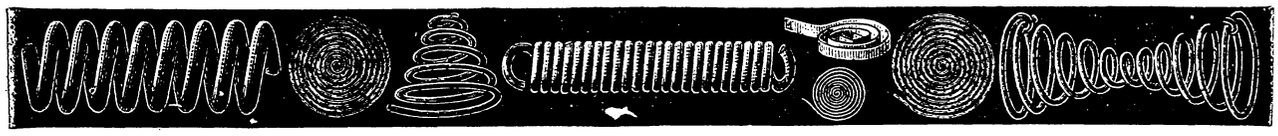

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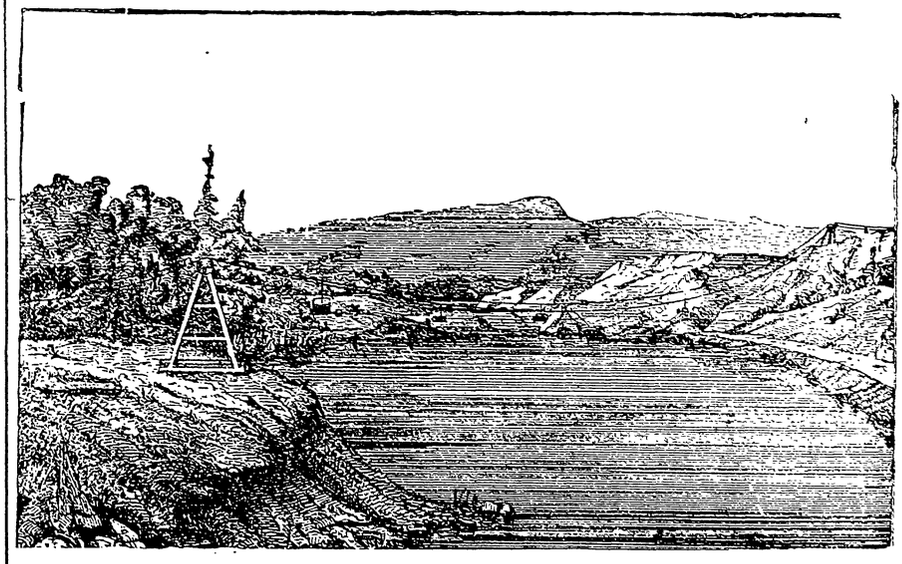

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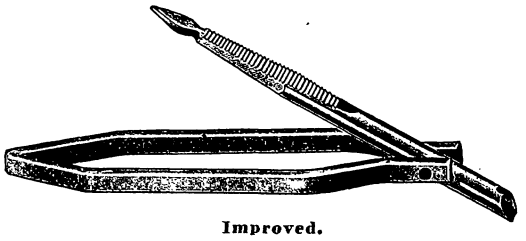
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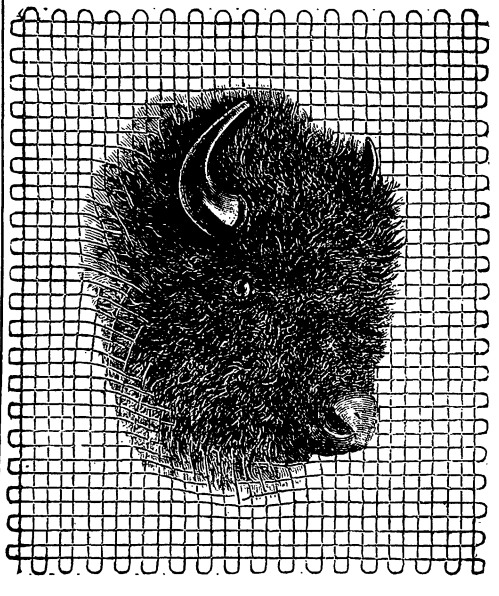
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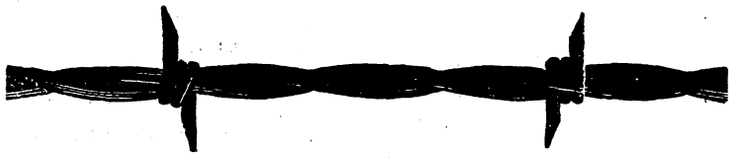

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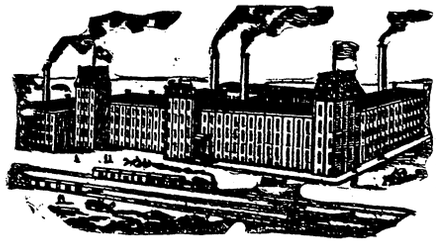

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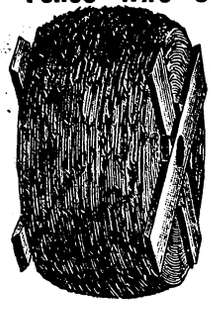

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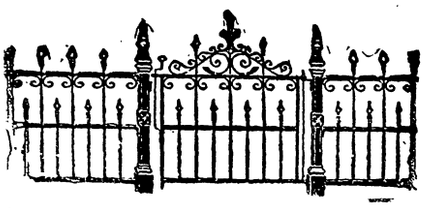

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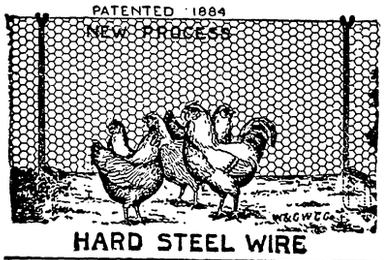

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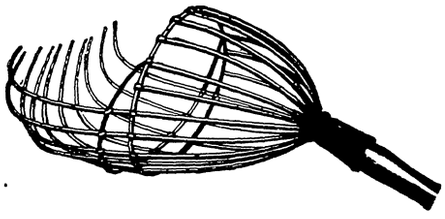

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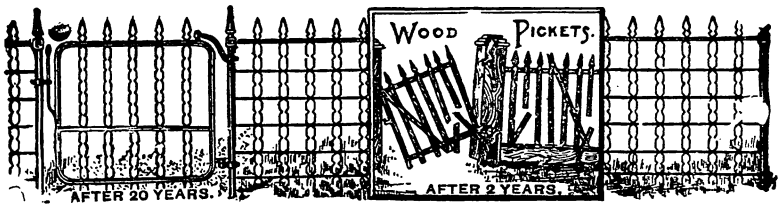

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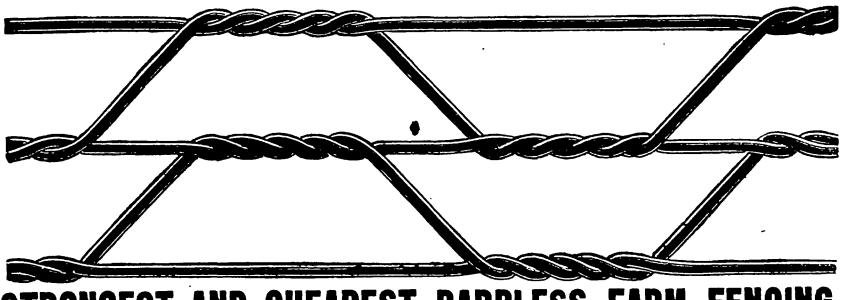

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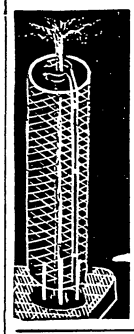

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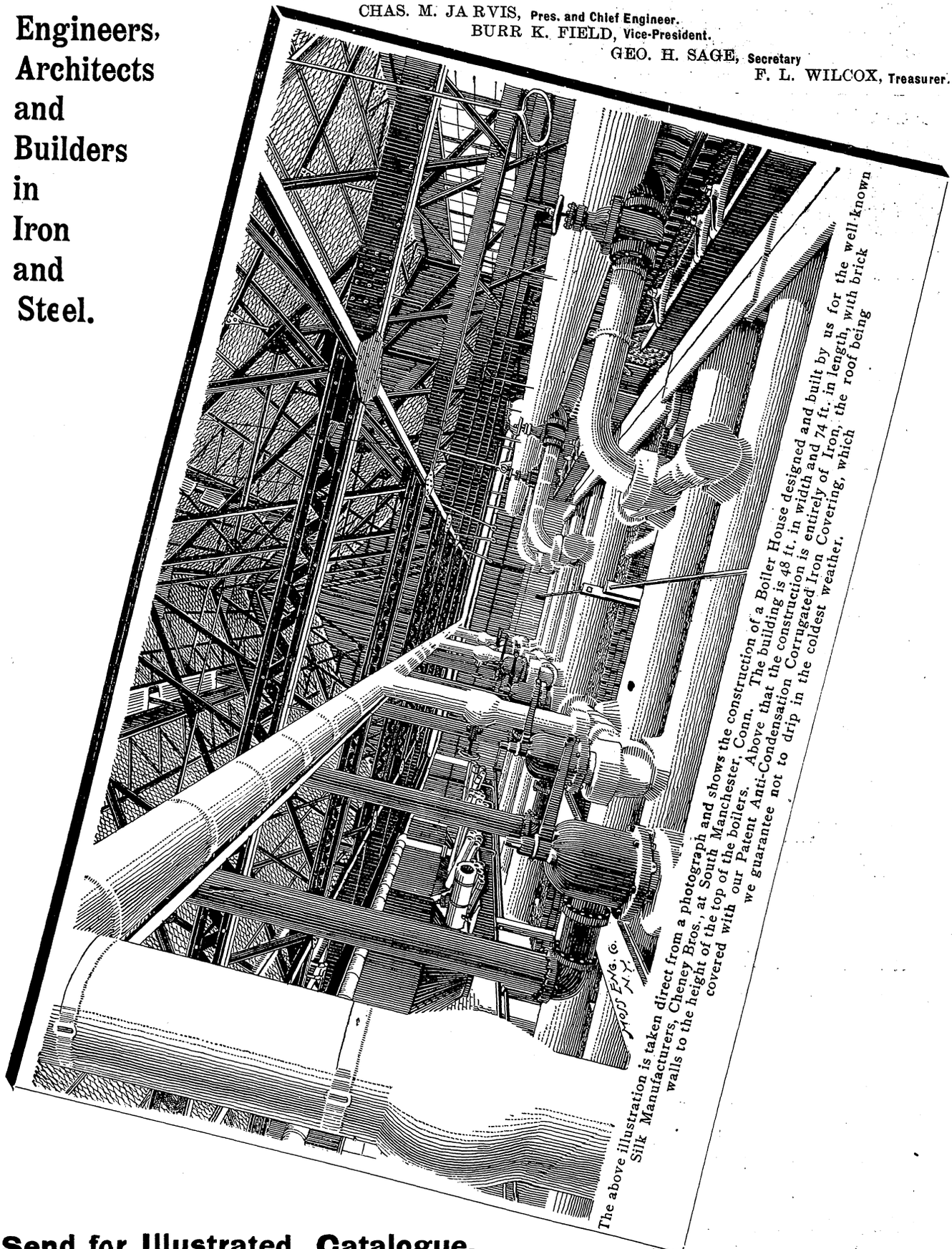

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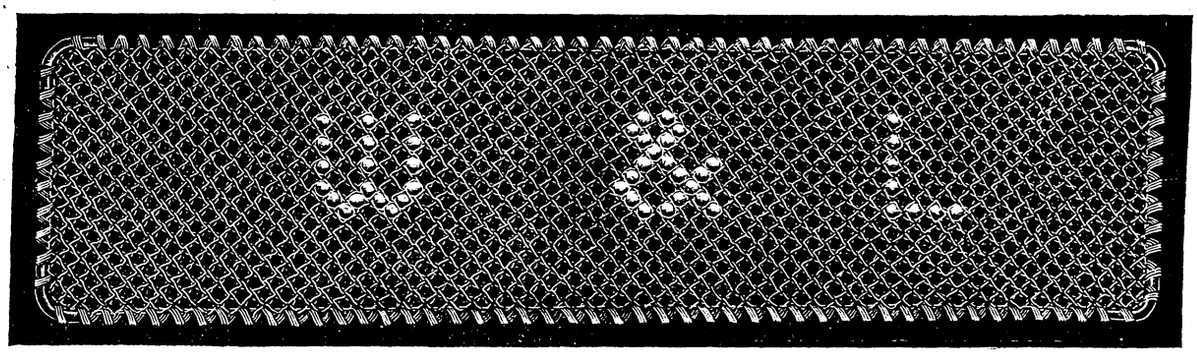

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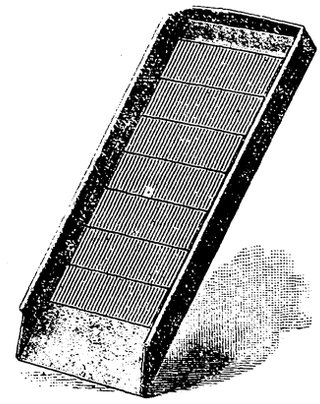

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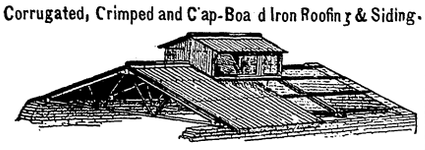

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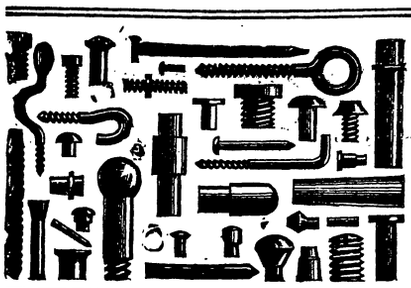

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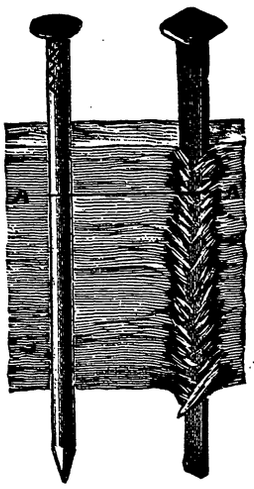

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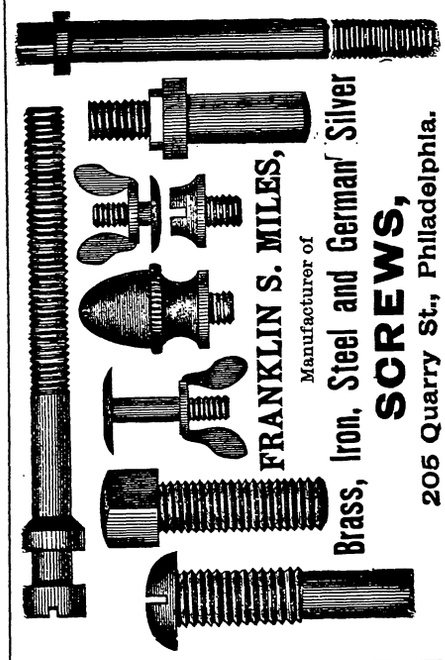

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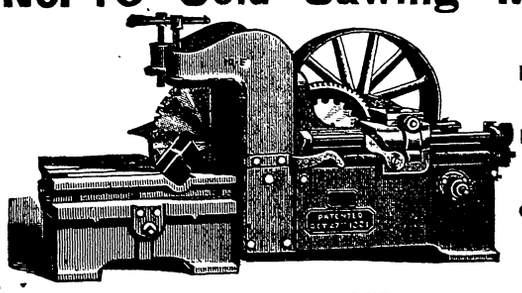

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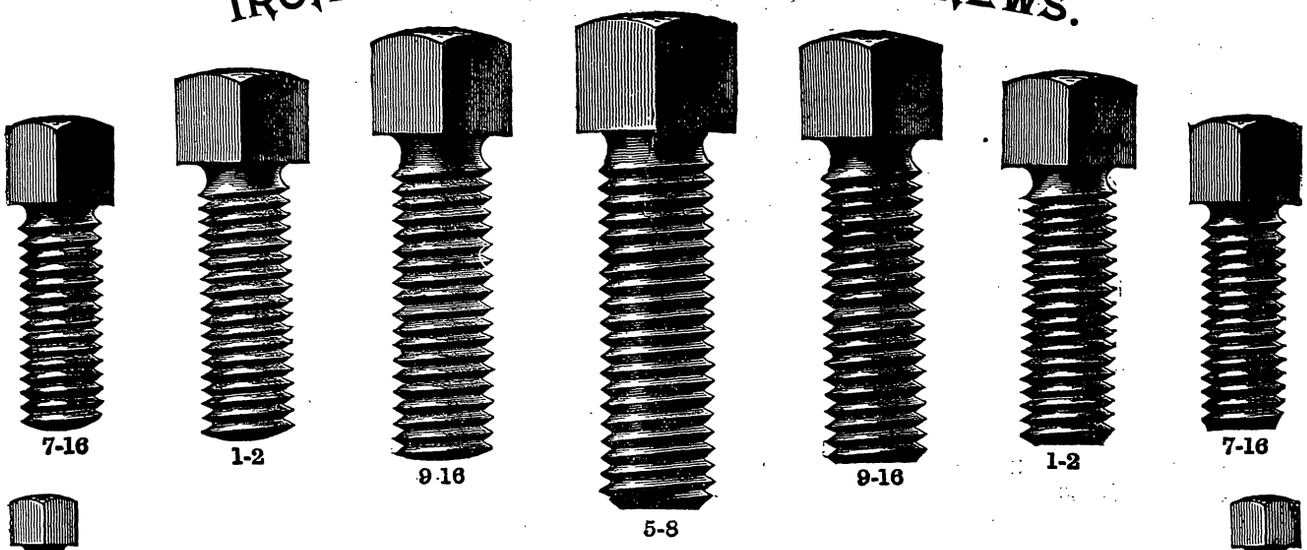

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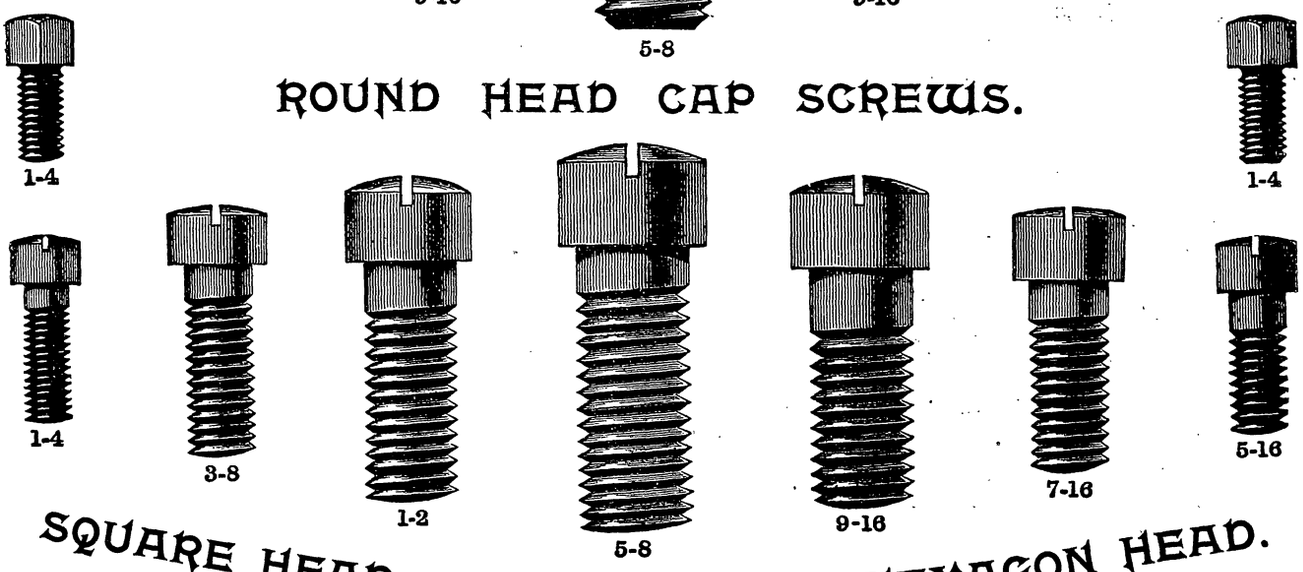

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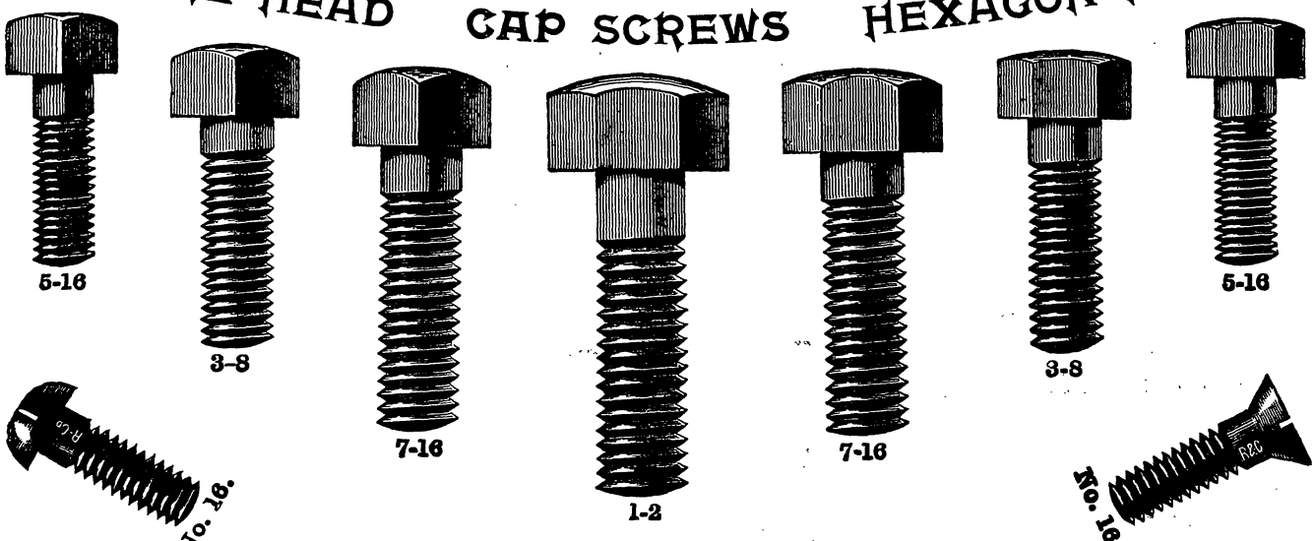

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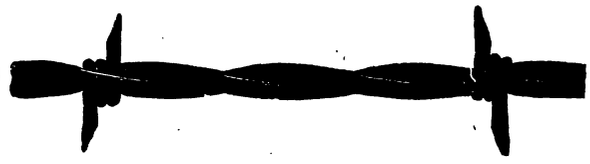
BARBED  WIRE.

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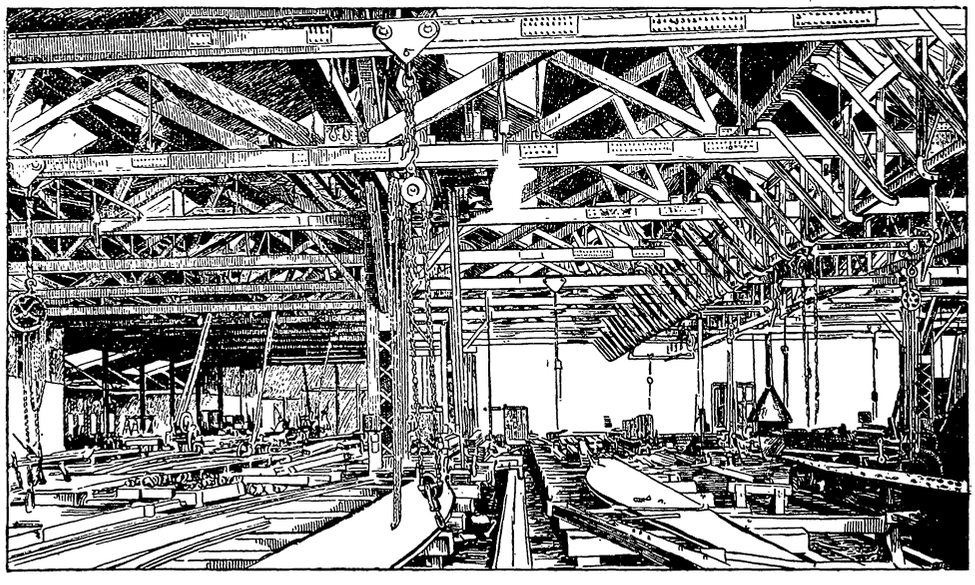

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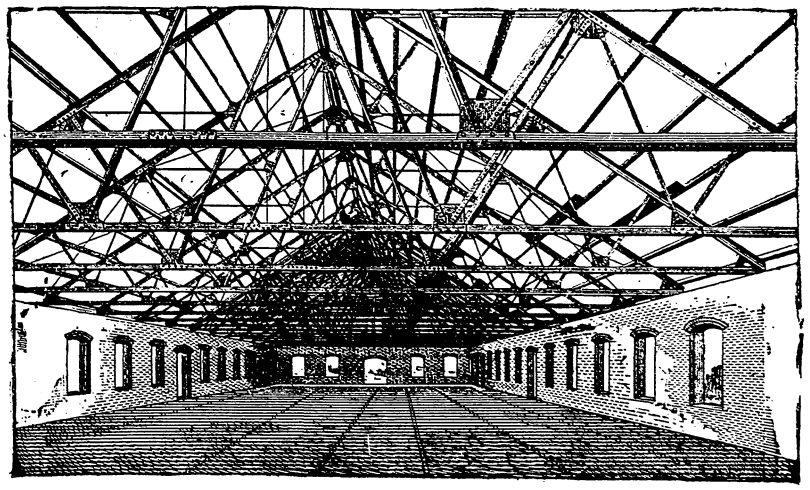

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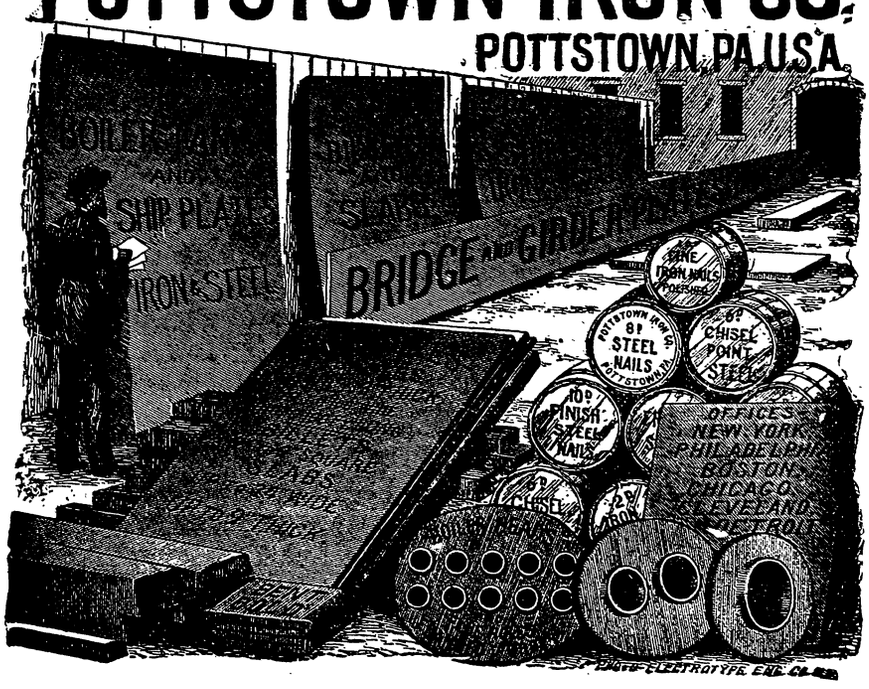

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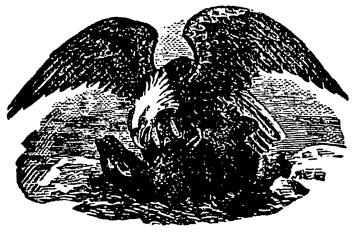
TRADE  MARK.

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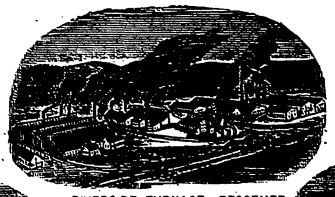

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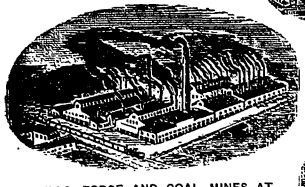

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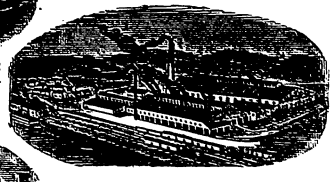

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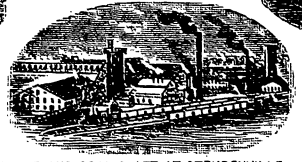

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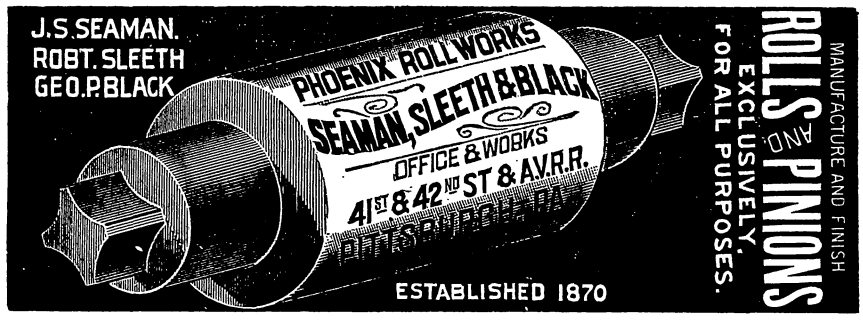

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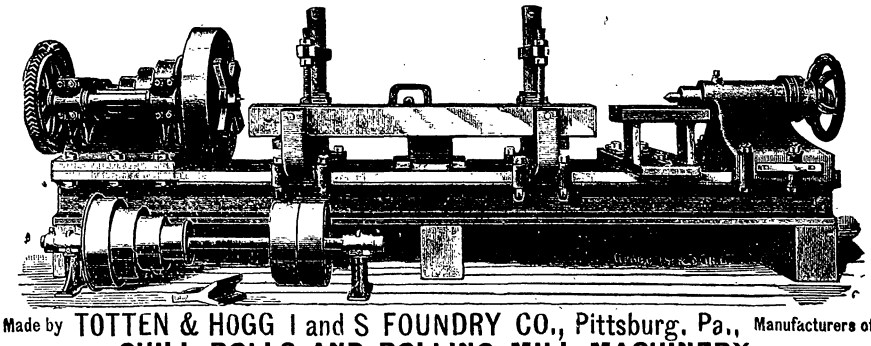

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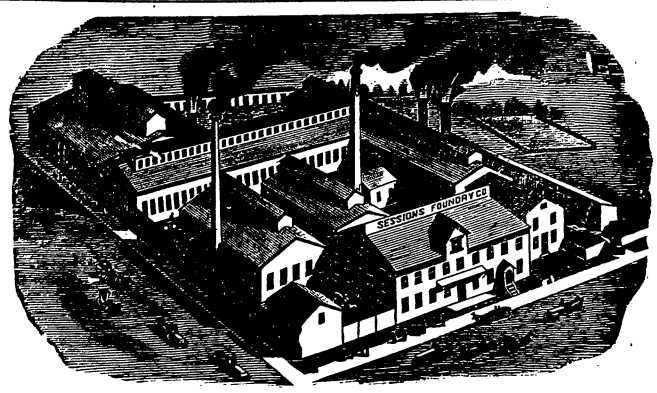

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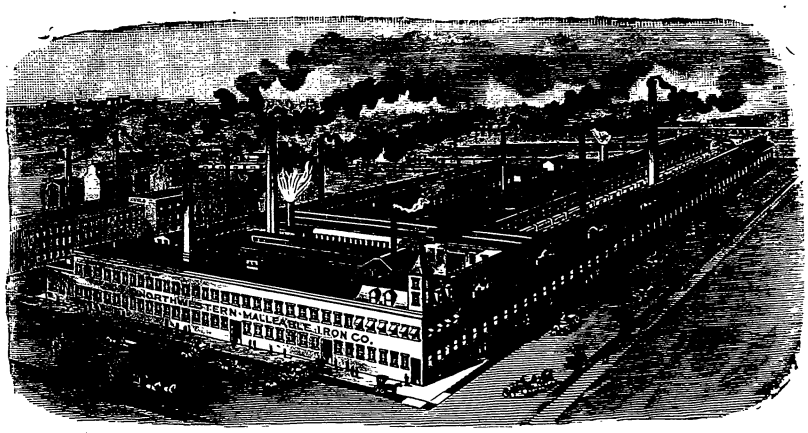

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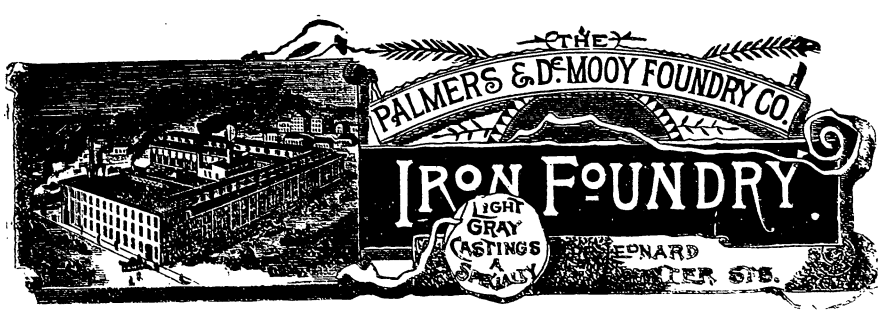

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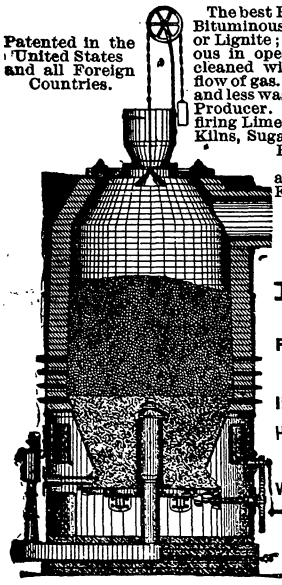

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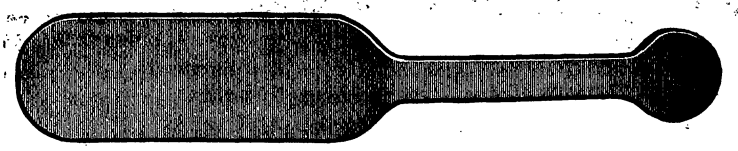

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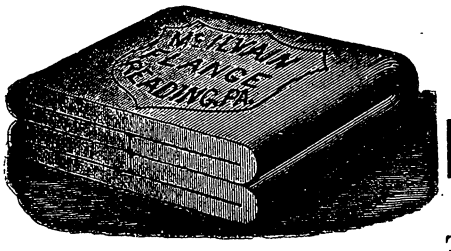

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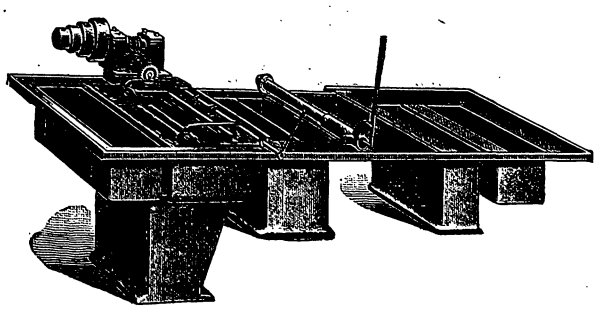

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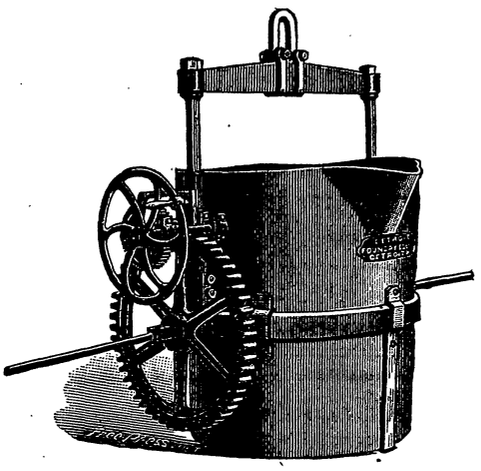

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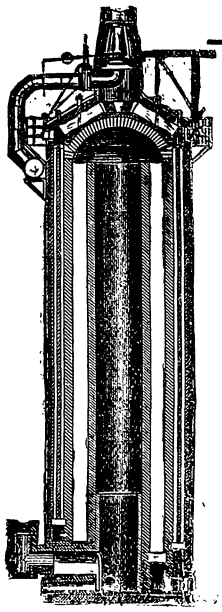

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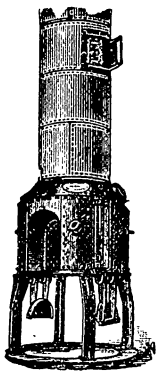

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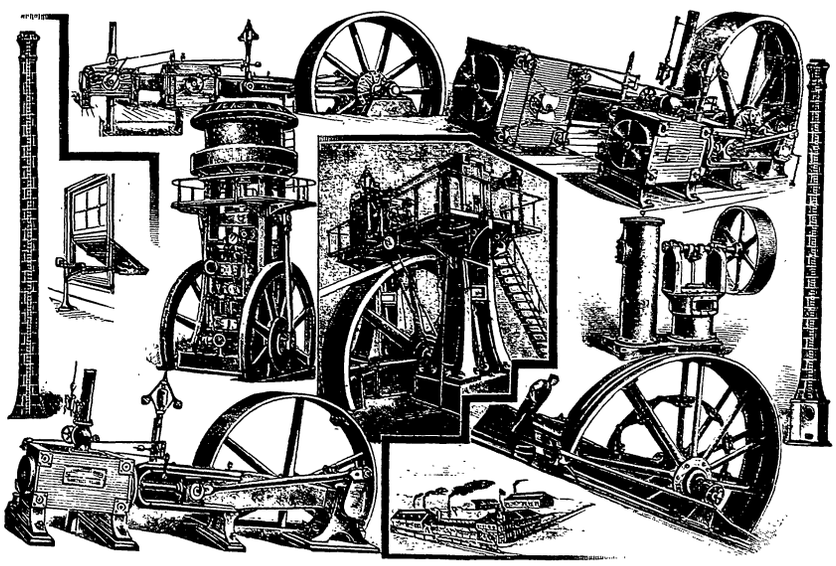

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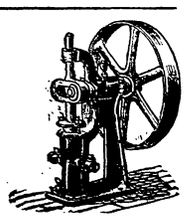

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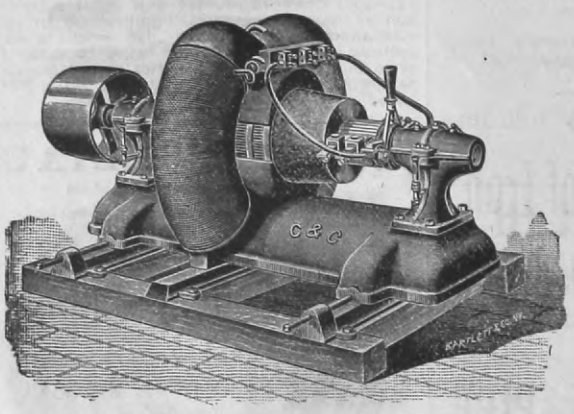

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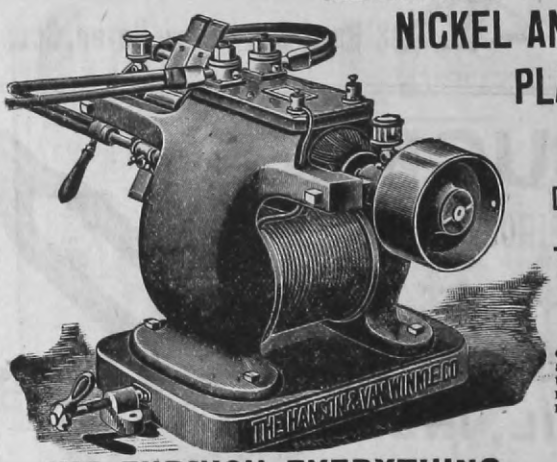

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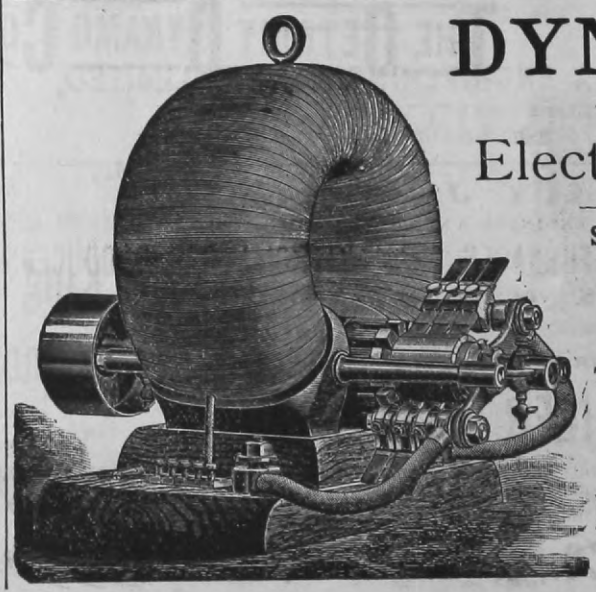

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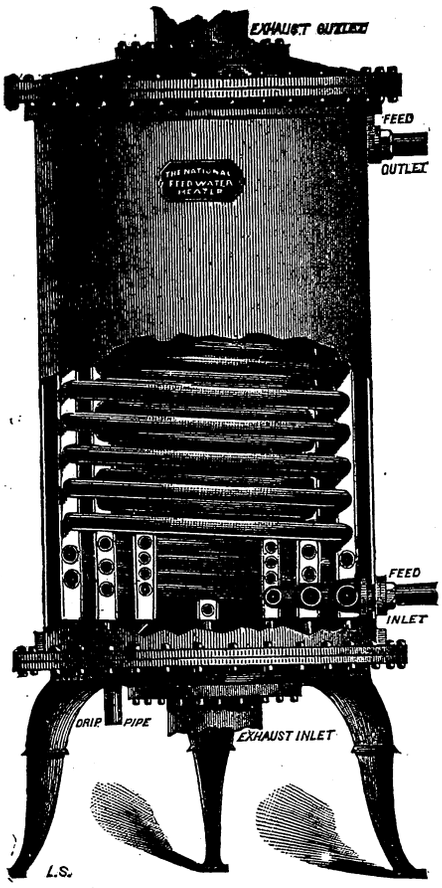

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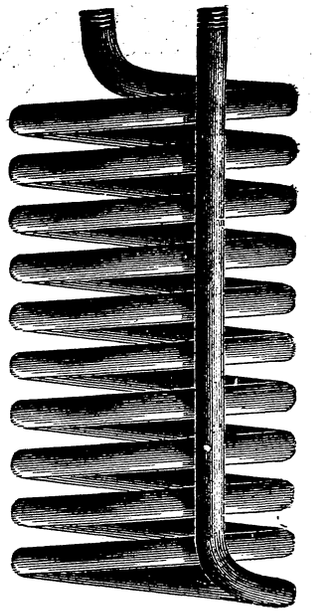

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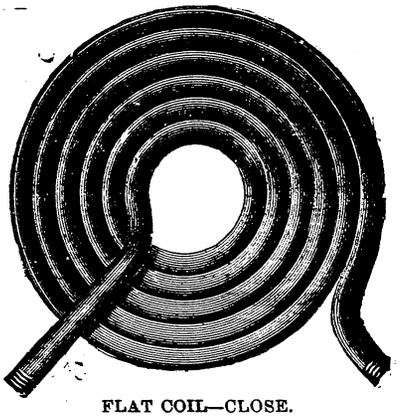

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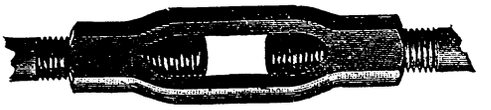

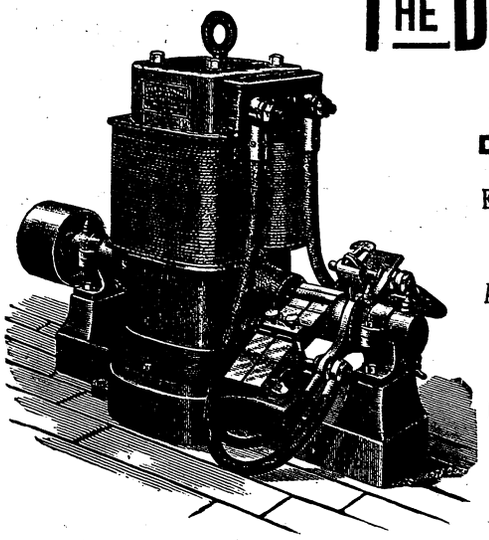

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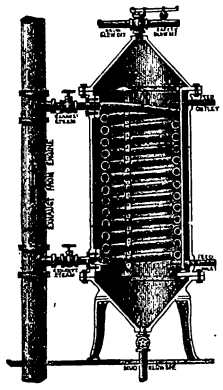

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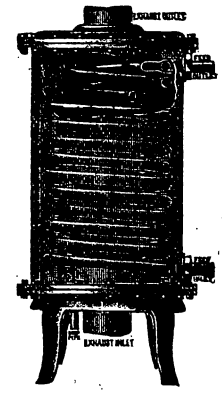

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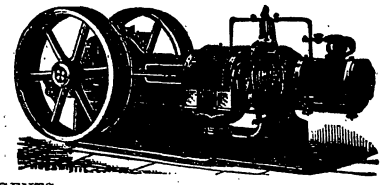

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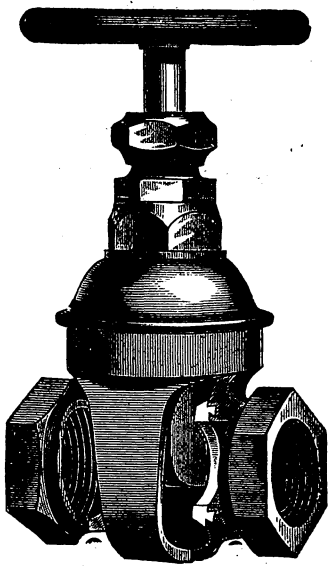

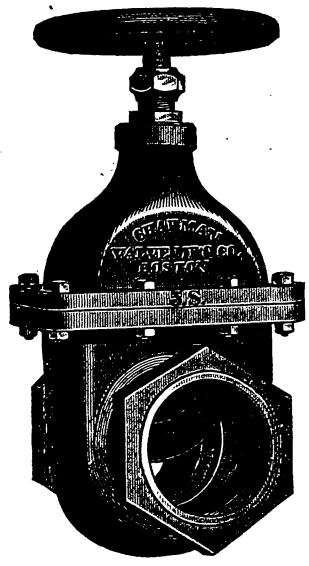

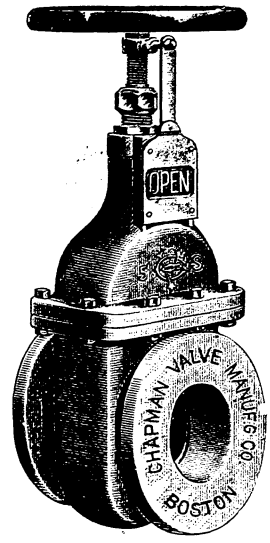

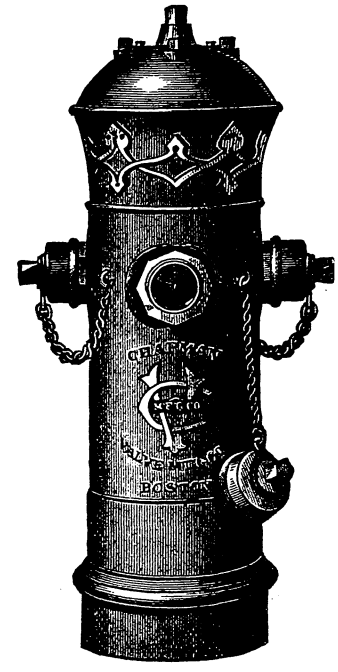

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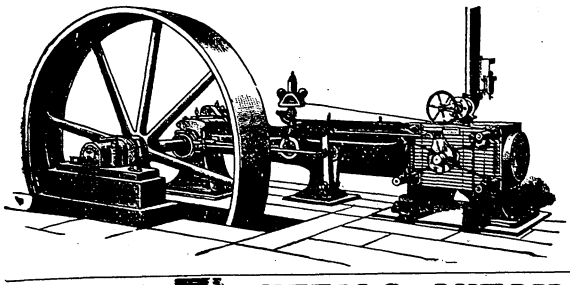

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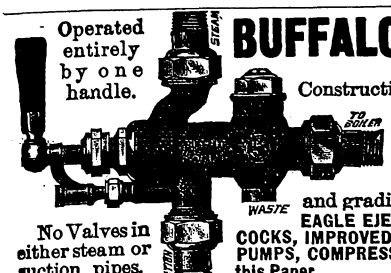

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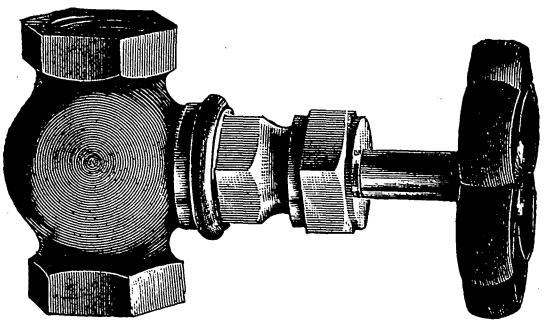

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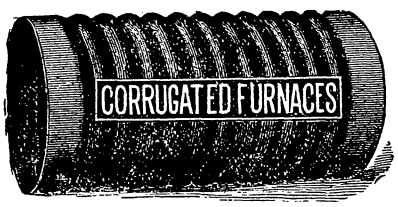

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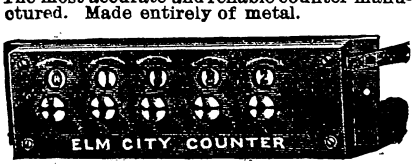

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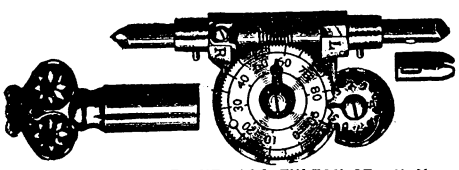

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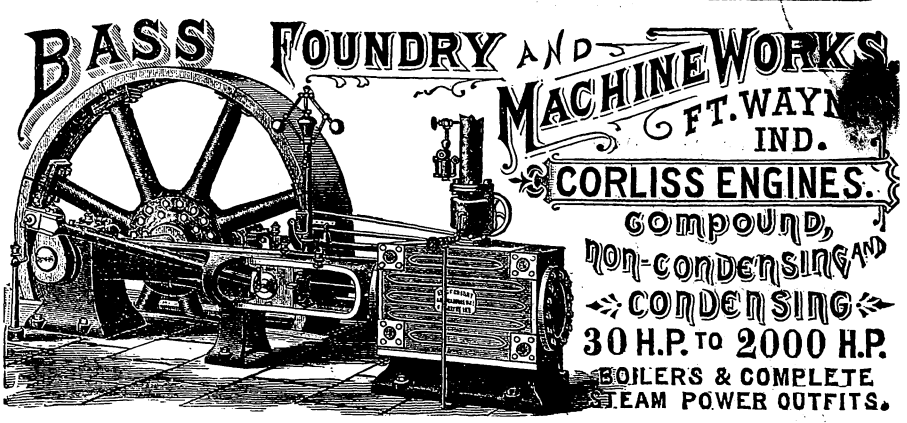

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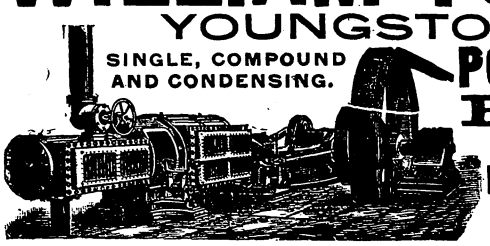

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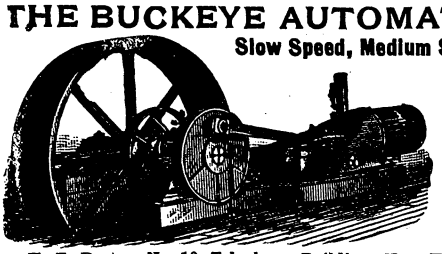

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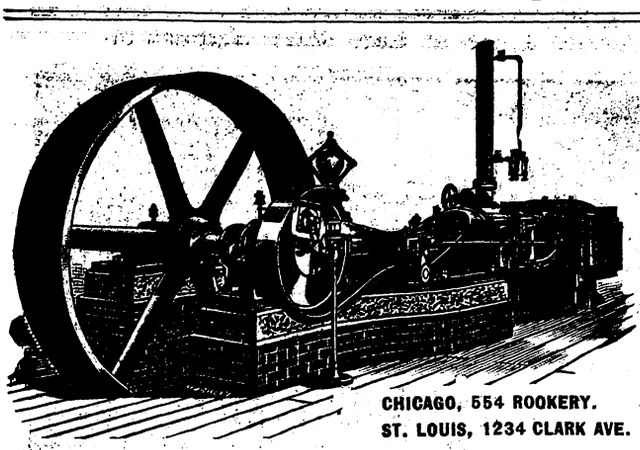

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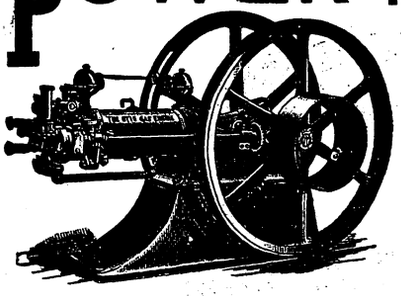

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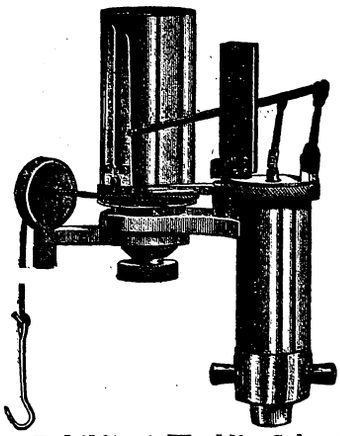

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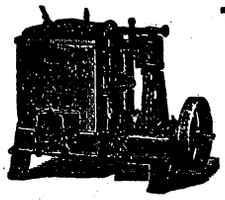

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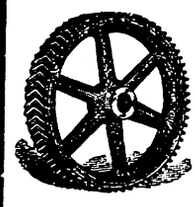

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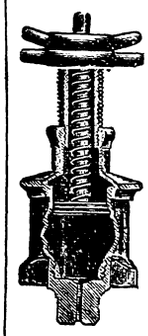

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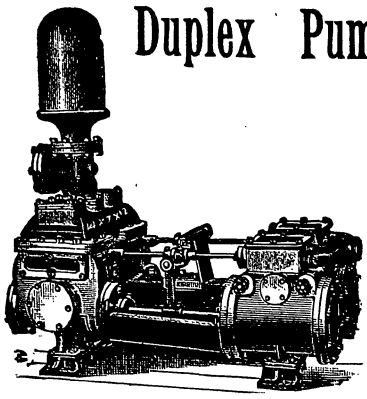

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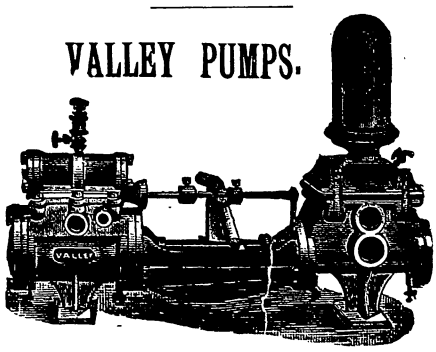

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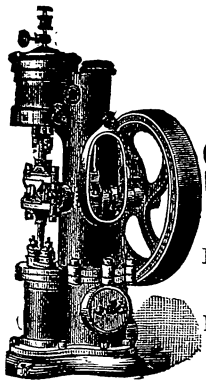

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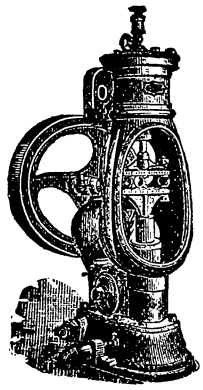

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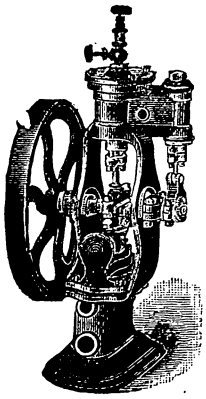

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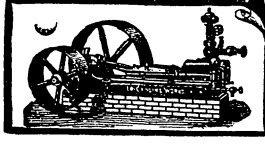

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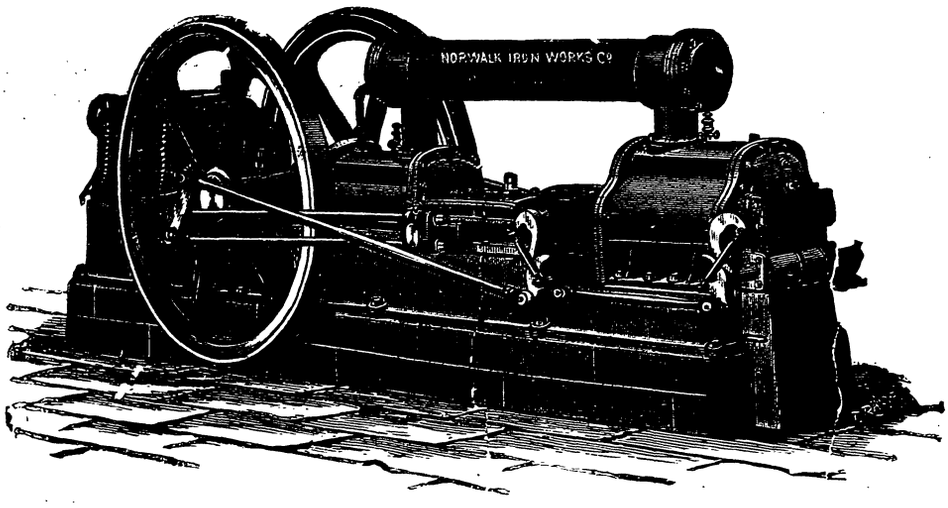

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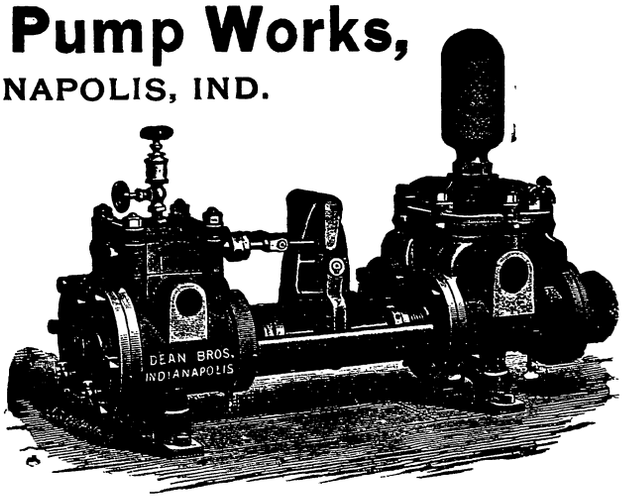

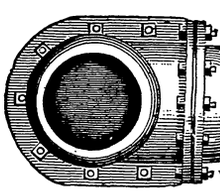

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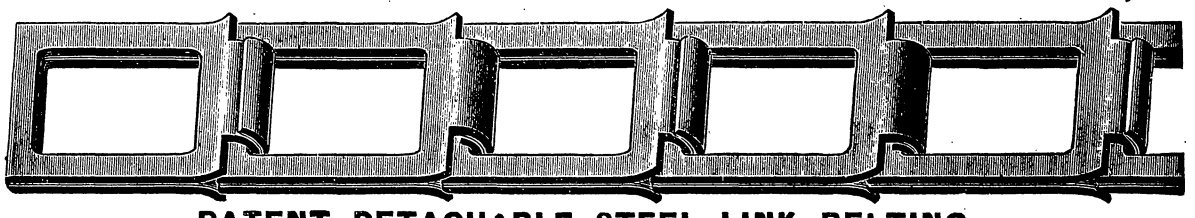

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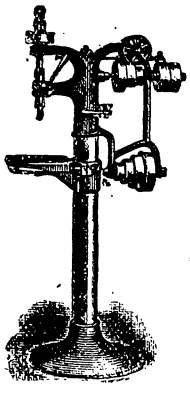

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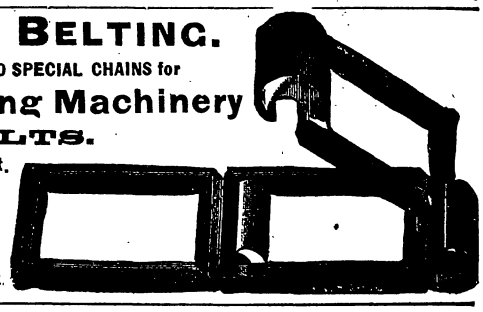

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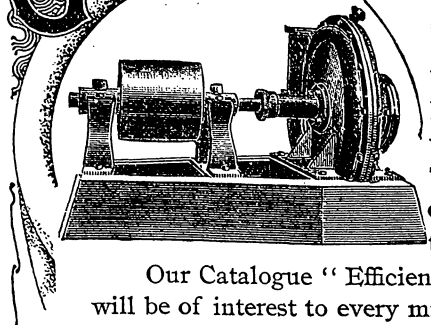

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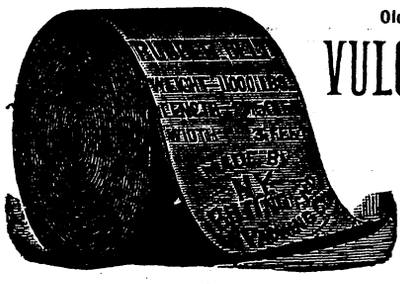

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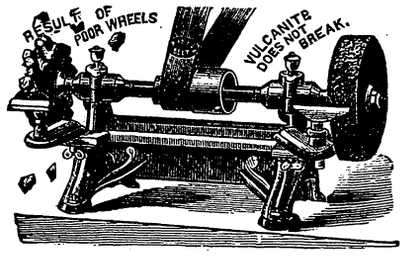

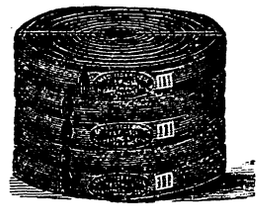

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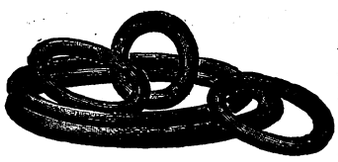

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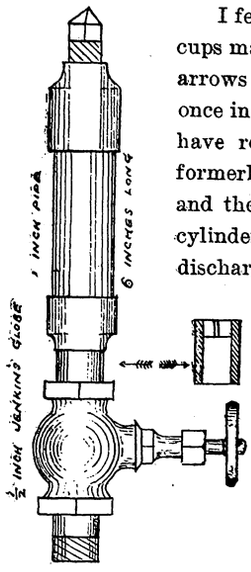

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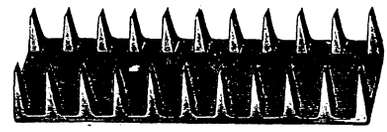

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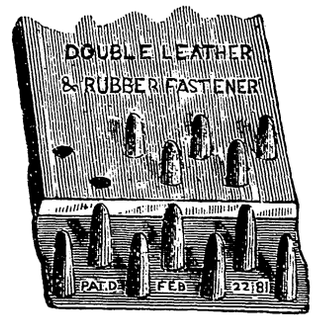

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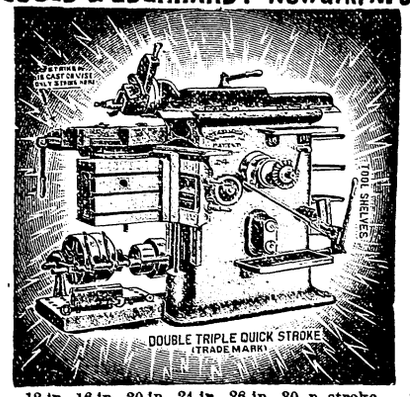

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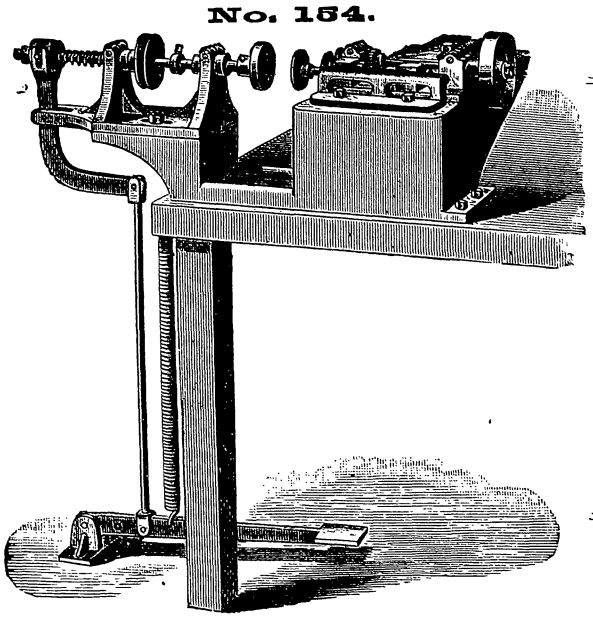

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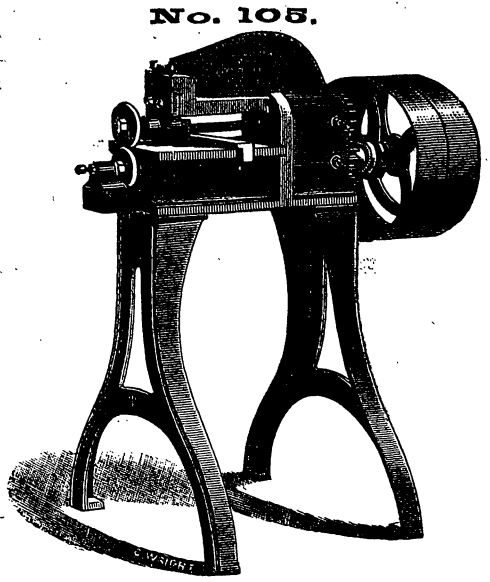

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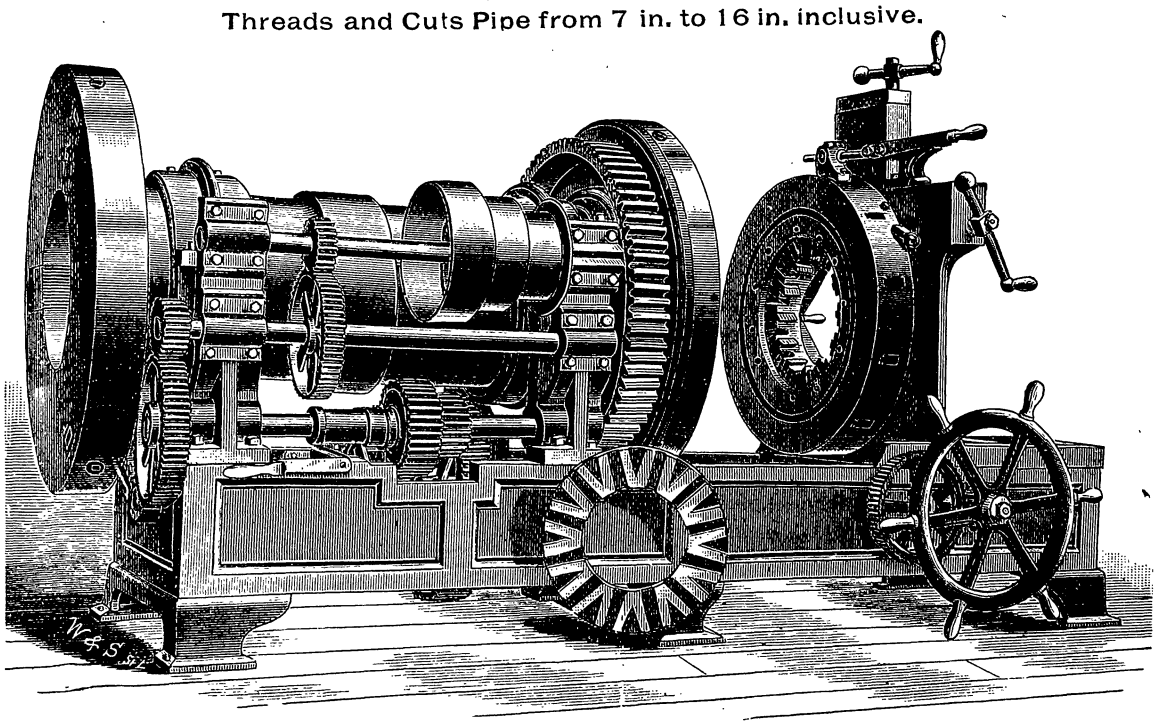

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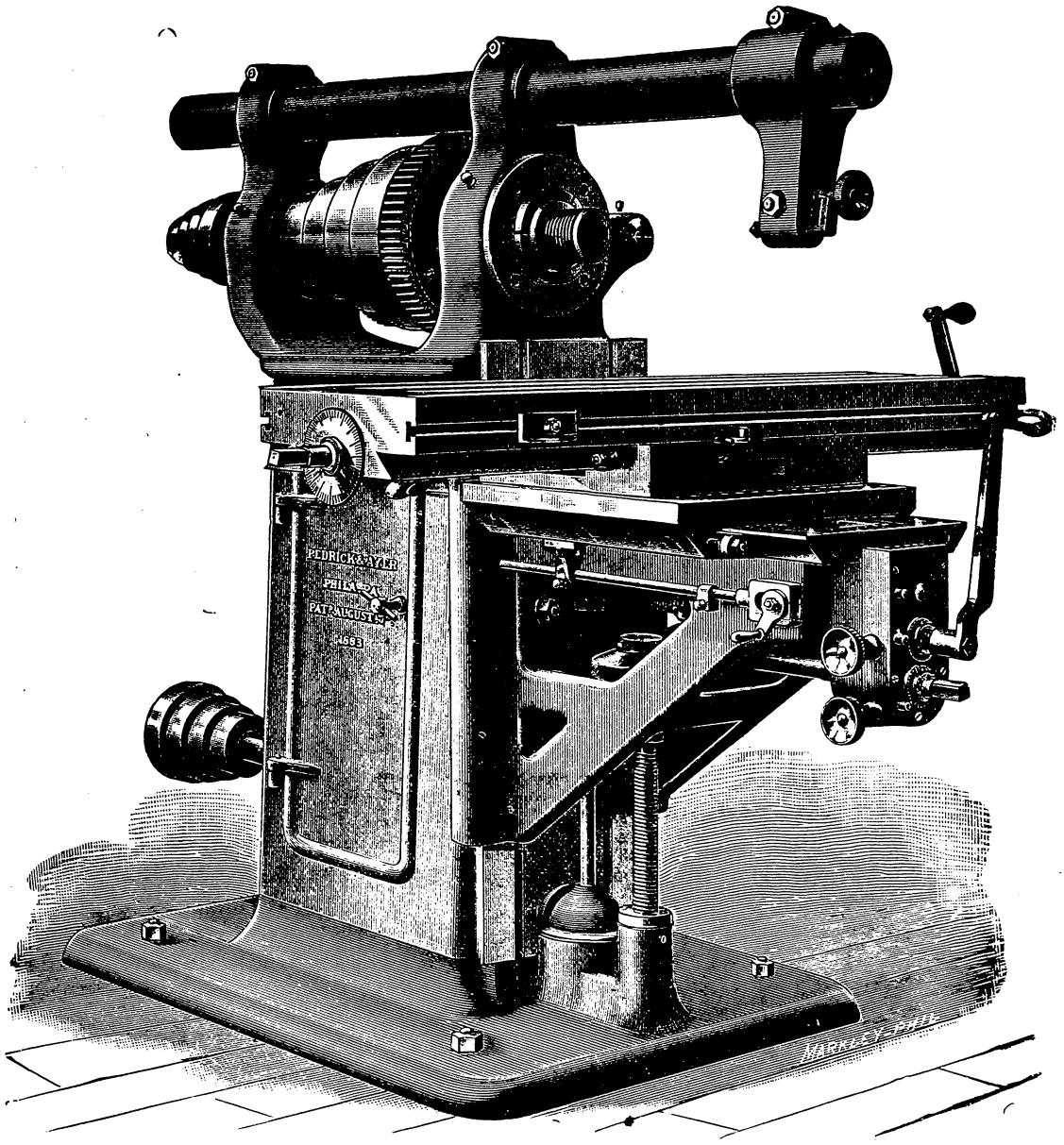

This machine is far superior in every way to any other universal machine built; it not only admits of a greater range of positions, but will do much work that would be impossible on any other machine.

It is designed for BORING, DRILLING, FACING, TURNING, MILLING, PROFILING, KEY-SEATING, SPLINING, RACK CUTTING (any length), GEAR CUTTING with the vertical attachment up to five (5) feet diameter, etc.

All adjustments have Micrometer Dials. **Automatic Feeds in all directions.** Diameter of main journal, 3½ inches and 6 inches long. Solid self-centering journal bearings always retaining center alignment.

Special Catalogue mailed on application.

PEDRICK & AYER,

Nos. 1001 and 1003 Hamilton Street, Philadelphia, Pa.

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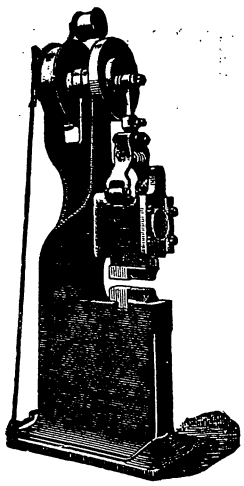


The Dupont Power Hammer.

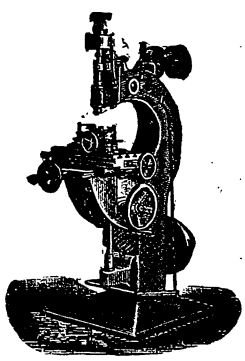
ITS POINTS OF SUPERIORITY.

No. 4. DURABILITY.

Every effort has been made in constructing this Hammer to make all parts of such proportions as to insure durability. The simplicity of its design leaves few parts to break. The workmanship is the best that can be obtained, and no pains or expense are spared to have the work done in the best possible manner. The material used in the construction of these Hammers is the best that can be obtained. The ram or hammer-head together with the links, side-arms, sleeve and connection, is of wrought iron. The crank and joint-pins are of forged steel, and the castings for other parts the best to be had—every piece used in the construction of the Hammer being iron or steel except the bronze bushing in the crank connection.

DUPONT MANUFACTURING COMPANY,

ST. JOHNSBURY, VT.



NO. 2.

THE BECKER UPRIGHT UNIVERSAL MILLERS

Have a remarkable range of utility and are more indispensable than common horizontal millers.

No. 2 is adapted for a great variety of light milling, carrying mills from 1-32 in. diam. up to 2 in. diam. Speeds from 100 to 10,000 revolutions per minute.

No. 3, for all round work, such as *Face Milling, Milling Dovetail Slides, Key Seating, Splining, Boring* and many other purposes. Carries mills from 1-8 in. to 4 in. diam. Speeds from 40 to 2000 revolutions per minute.

SEND FOR CATALOGUE.

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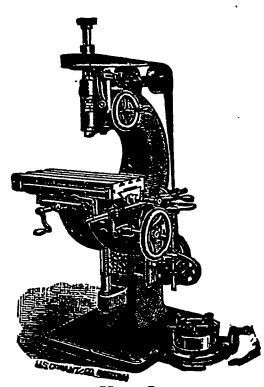
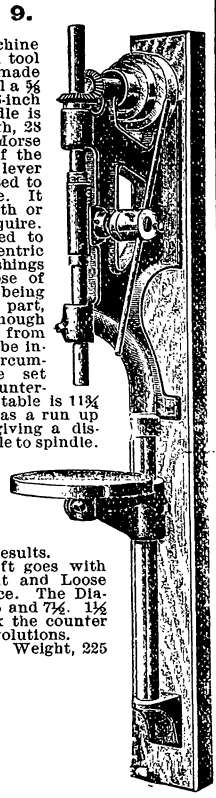


NO. 3.

16-inch Lever Post Drill,

No. 9.



Intended for use in Machine Shops where a high-priced tool is unnecessary, being well-made and very useful. Will drill a ⅝ hole to the center of a 16-inch circle, 5¼ deep. The spindle is steel, 15-16 diameter, length, 28 inches, and is bored for a Morse Taper, No. 1. The run of the spindle is 5¼ inches. The lever is easily and quickly adjusted to any position of the spindle. It can be used its entire length or not, as circumstances require. The pinion gear is adjusted to the rack by means of eccentric bushings, and these bushings serve the double purpose of taking up the wear, and being cut open in the thinnest part, they form just friction enough to prevent the spindle from falling. The friction can be increased or diminished as circumstances require, by the set screws. This makes a counter-weight unnecessary. The table is 11¾ inches in diameter and has a run up and down of 17 inches, giving a distance of 23 inches from table to spindle. The drill is securely attached to a 3-inch hard wood plank, planed perfectly straight. The drill is then set up and the table arm bored out for the table by its own spindle, giving perfectly true results.

A complete counter shaft goes with the drill. Diameter, Tight and Loose Pulleys, 7 inches, 2½ Face. The Diameters of the Cone is 3½, 5 and 7½. 1½ Face. For ordinary work the counter should make about 300 revolutions.

Total Length, 67 inches. Weight, 225 lbs.

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FRANK REED, Proprietor.

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FOR BOTH DOUBLE AND SINGLE LINKS.

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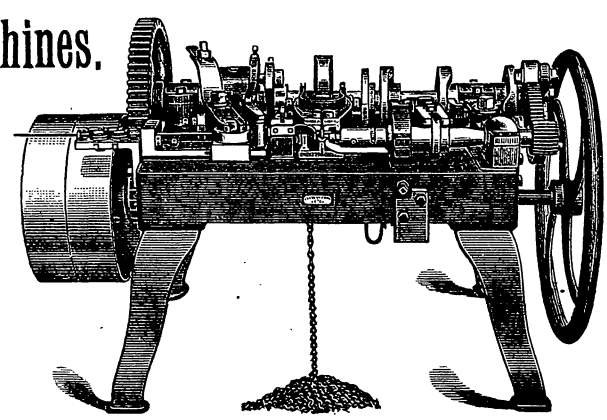

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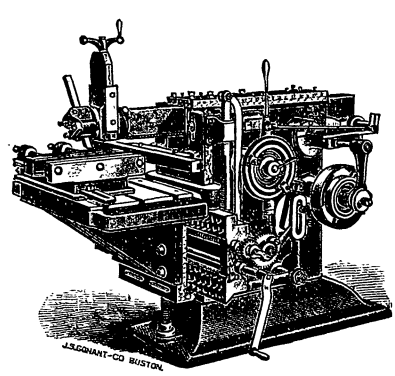

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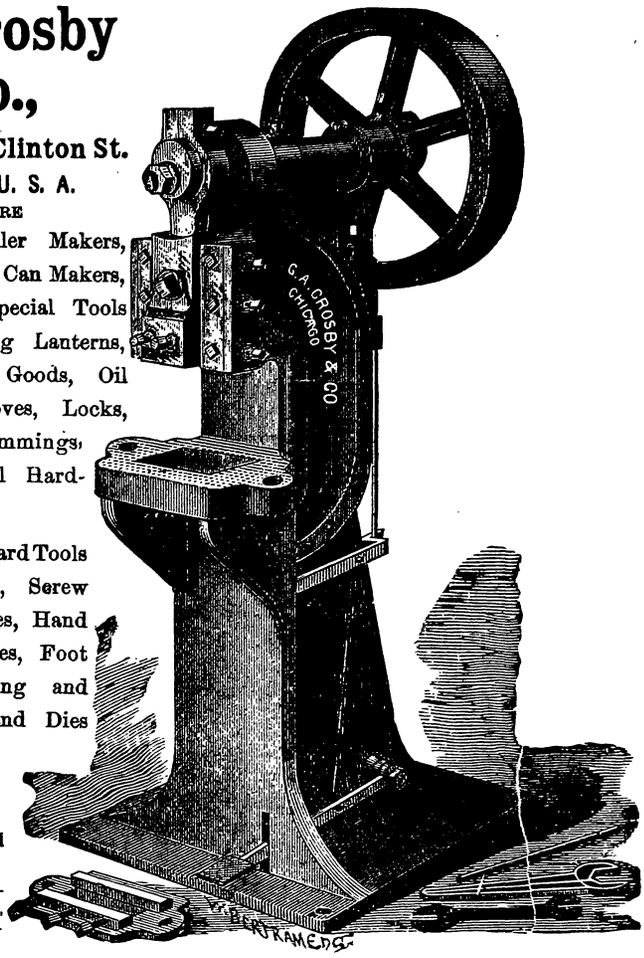

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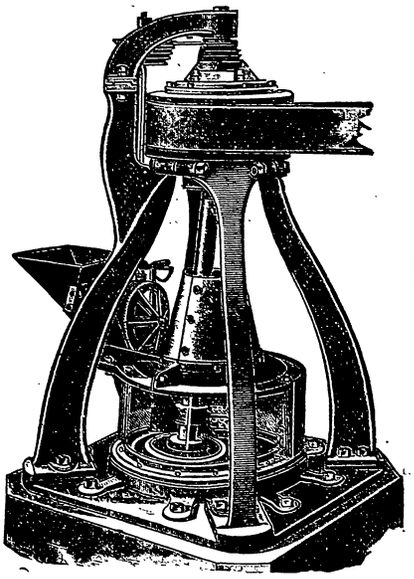

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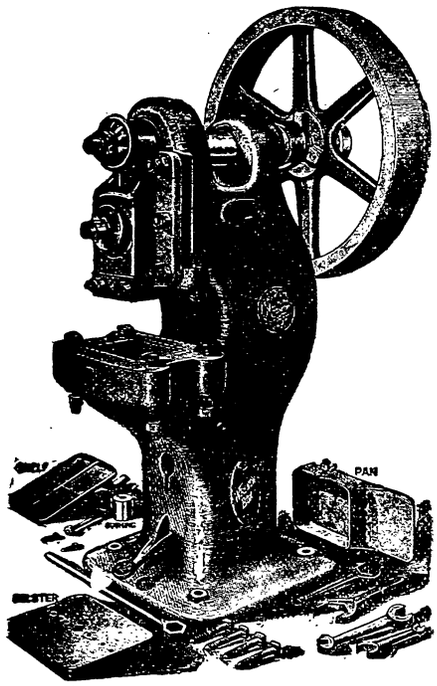

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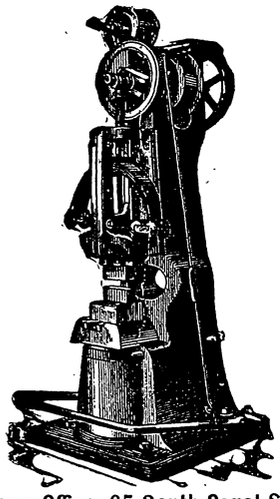

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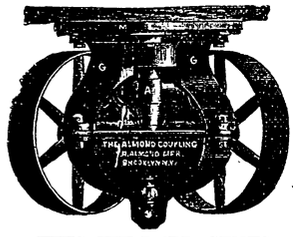

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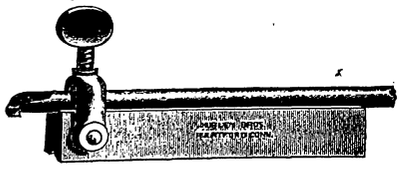

This tool is designed to save forging, and also to provide a stiff tool for boring or threading. The tool holder has a V slot milled in top and bottom, one being small to hold a small tool. The round steel can be drawn backward or forward as the work may require. We furnish this holder with one tool for $1.50.

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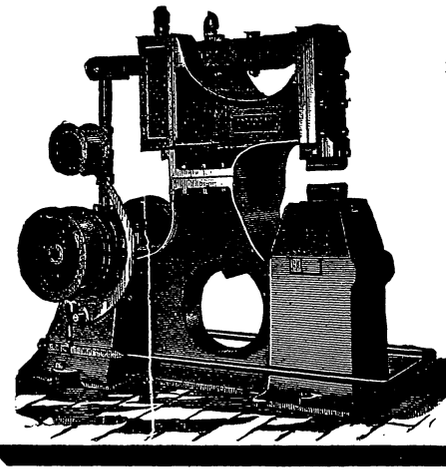

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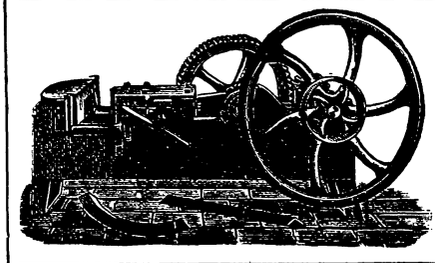

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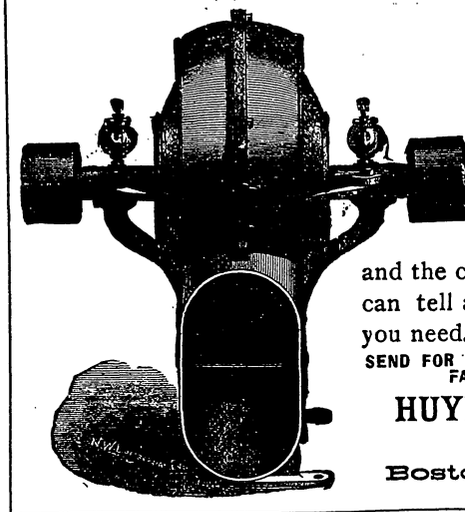

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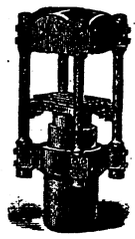

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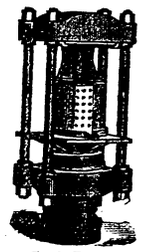

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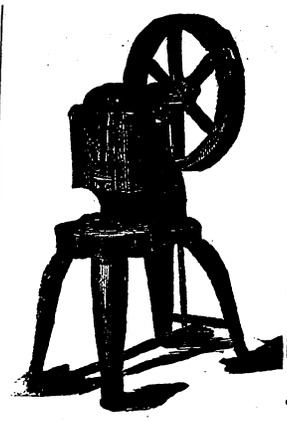

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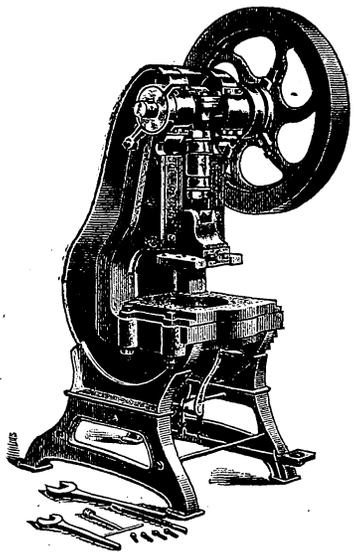

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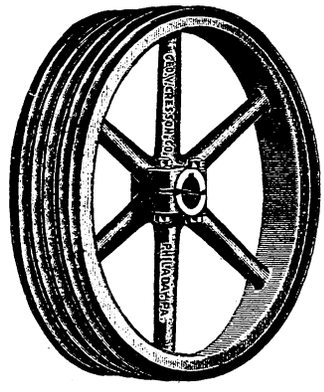

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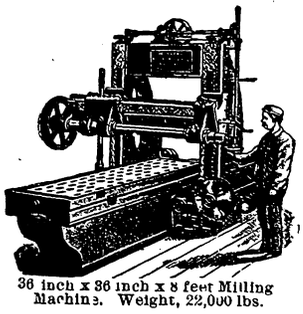

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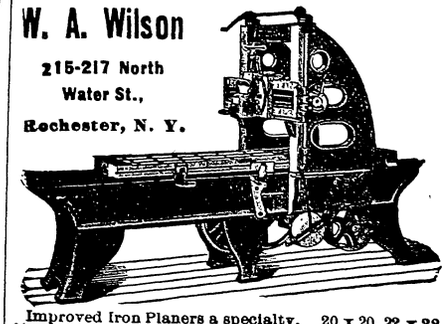

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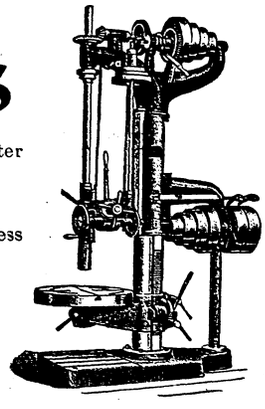

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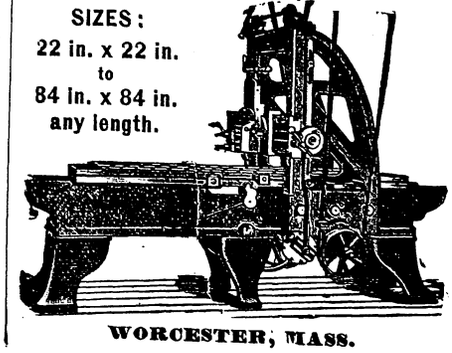

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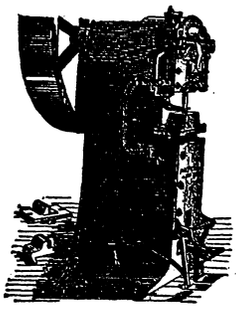

Machine for Punching, Shearing, Stamping, Forging, &c. The lower die-holder is movable when used for Forging Stamping, Bending, &c. This machine can be put up in any part of the building.

Bending Machine for Bar and Sheet Metal for House, Boat and other work which has to be done quickly, correctly and in large quantities.

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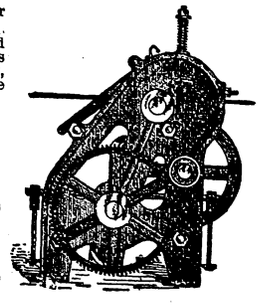

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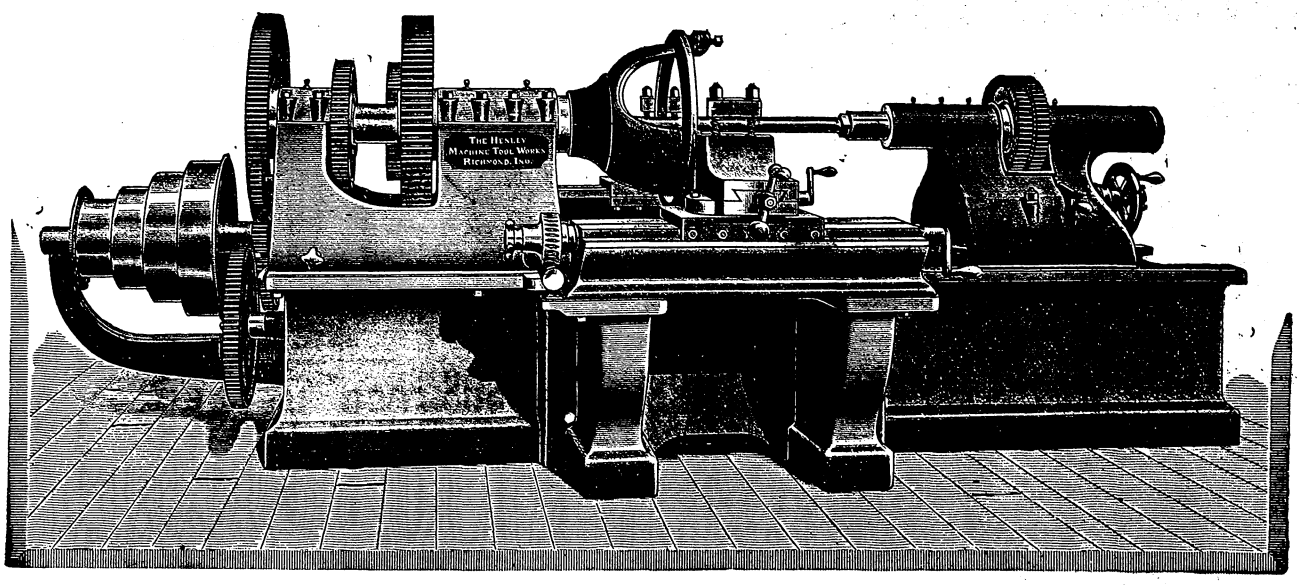
PULLEY LATHES



Patented Feb. 17, 1891; June 14, 1887.

This cut represents the 42-inch Lathe. The 60-inch Lathe is of same design, but much heavier throughout. The 30-inch Lathe is of same general construction, with the bed supported on feet at each end.

These Lathes are especially designed for Simultaneously Boring and Turning Pulleys, both straight and crowning face, Cone Pulleys, Gear Blanks, and a variety of other work.

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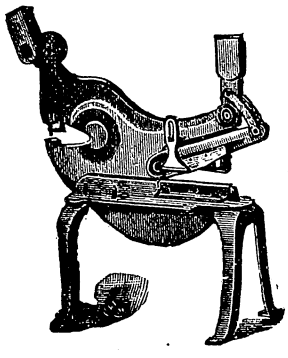

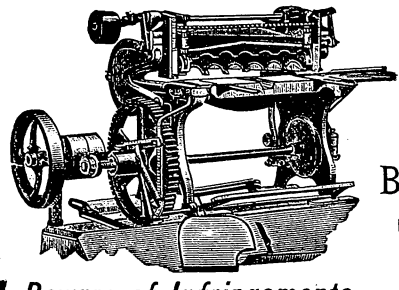

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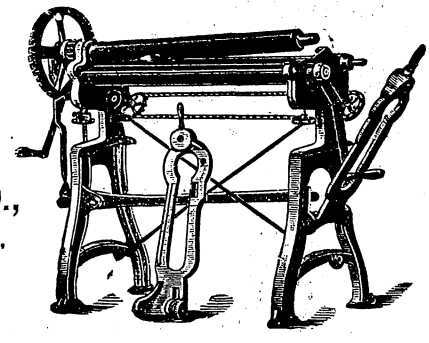
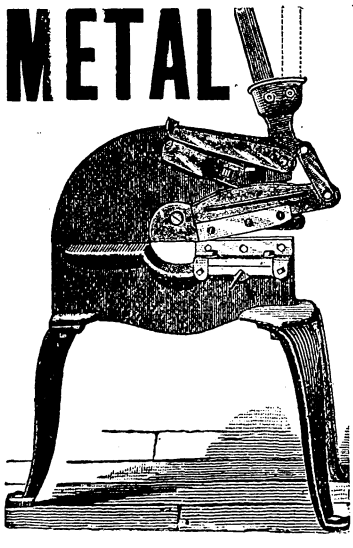
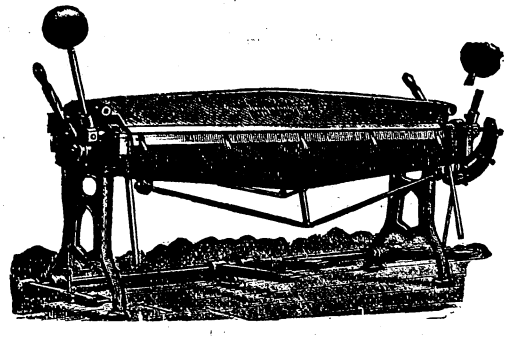


METAL WORKING MACHINES





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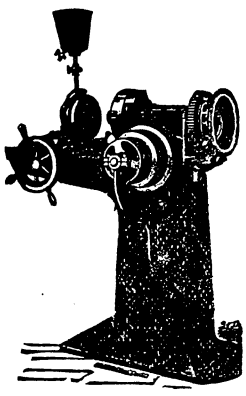

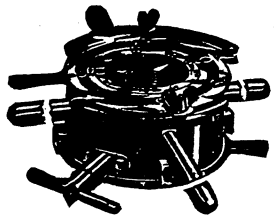

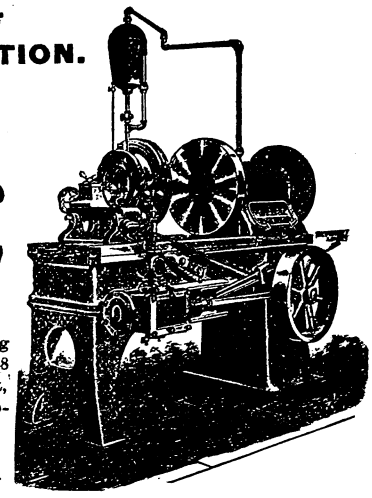

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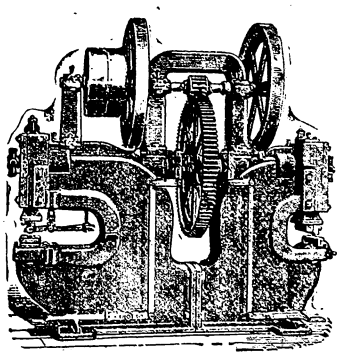

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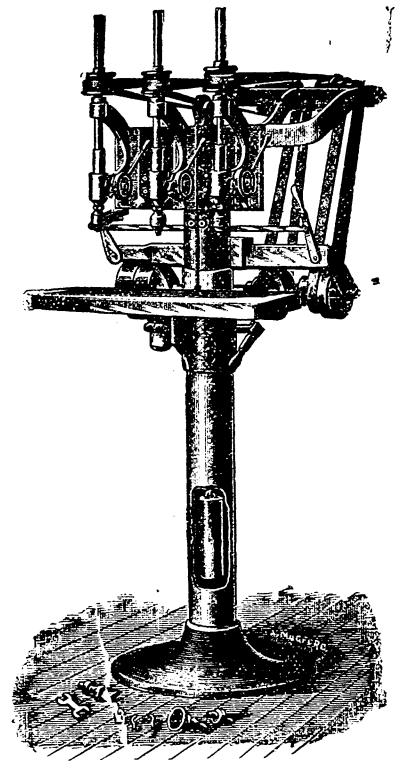

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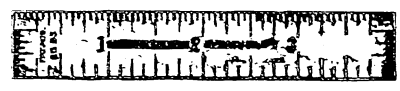

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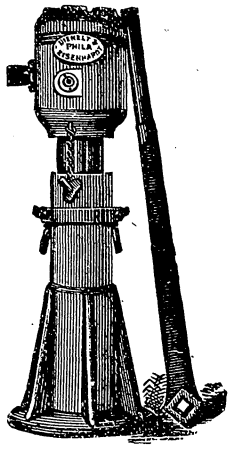

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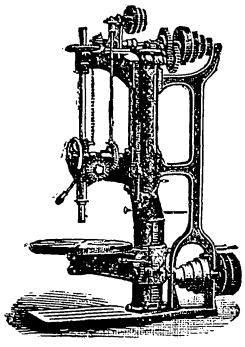

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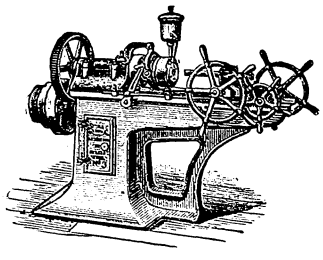

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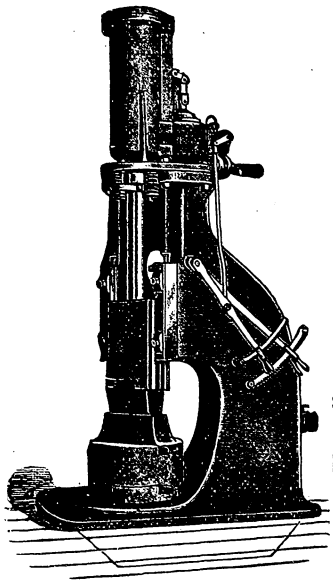

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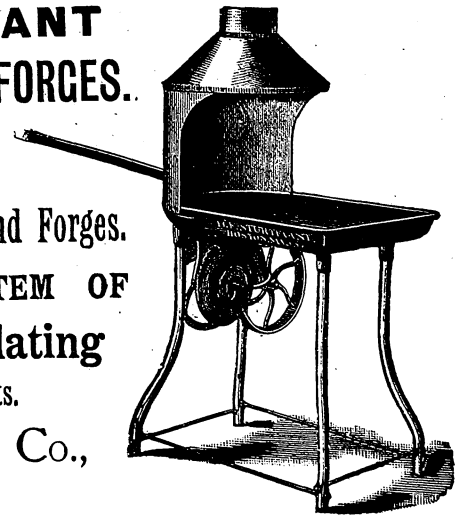

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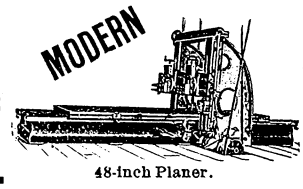

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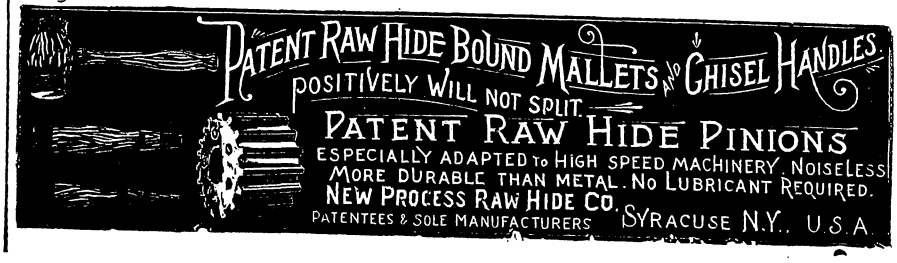

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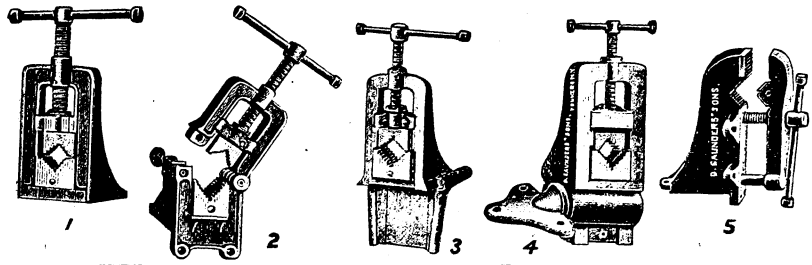

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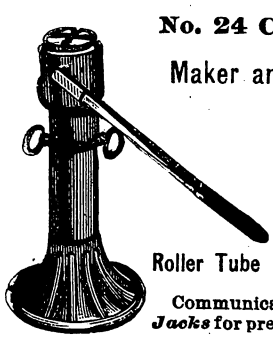

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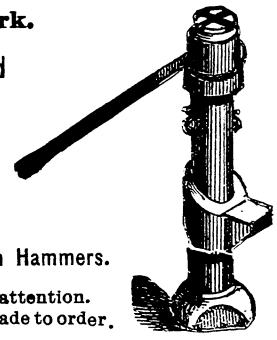

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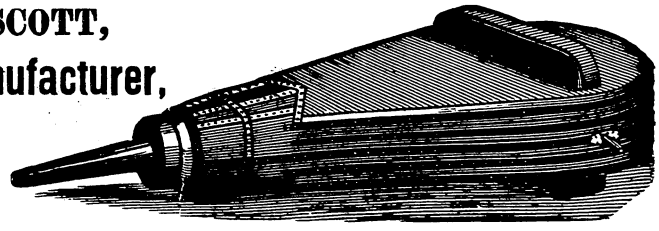

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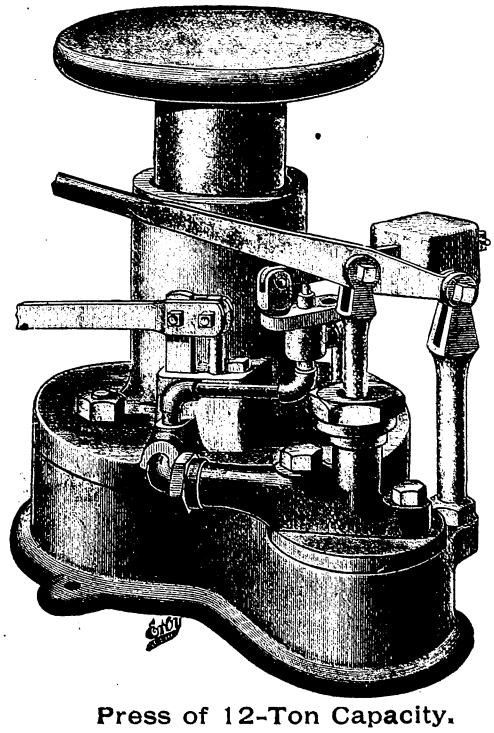

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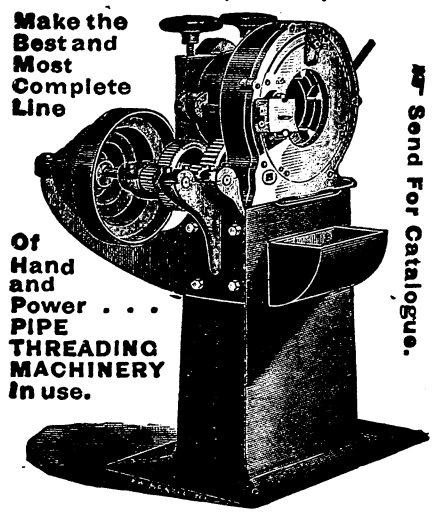

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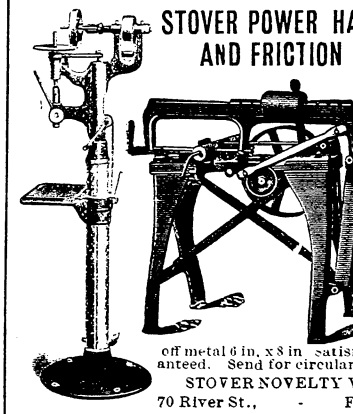

This Drill is for light sensitive and rapid drilling. Has greatest power when speed is slow and is most sensitive when speed is high. Power Hack Saw is made in two sizes, No. 1 cuts off metal up to 4½ in. No. 2 cuts off metal 6 in. x 8 in. Satisfaction guaranteed. Send for circulars and prices.

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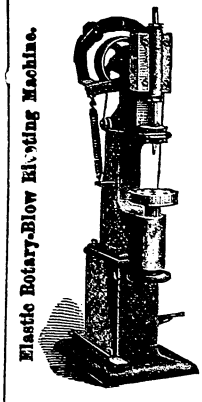

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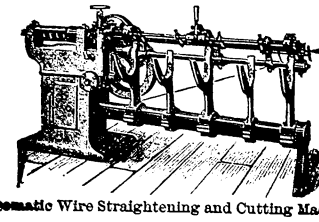

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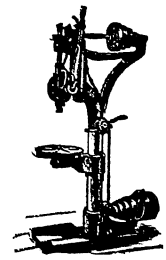

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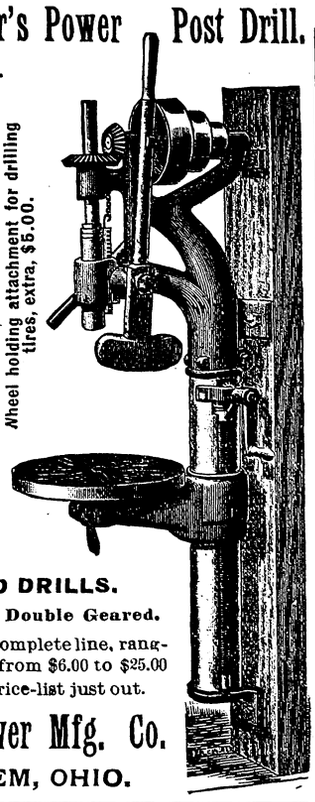

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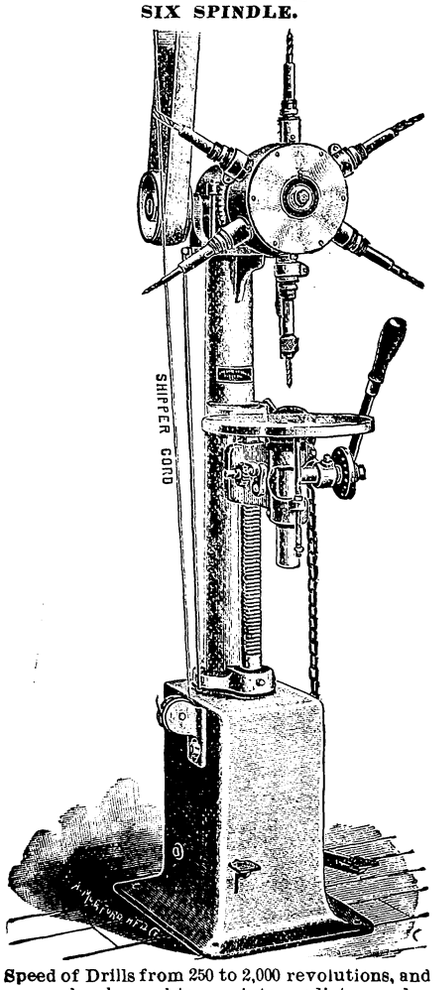

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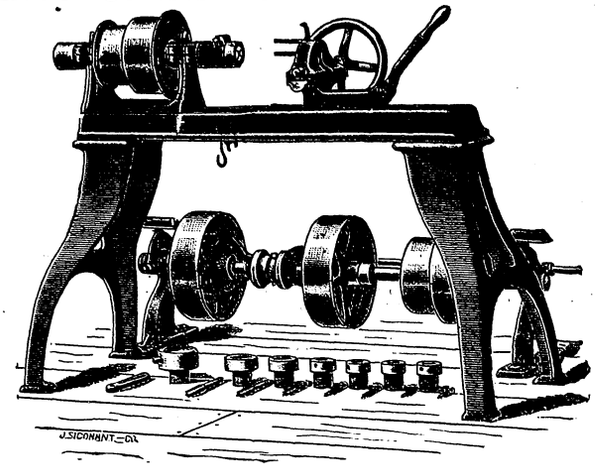

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Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

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The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and

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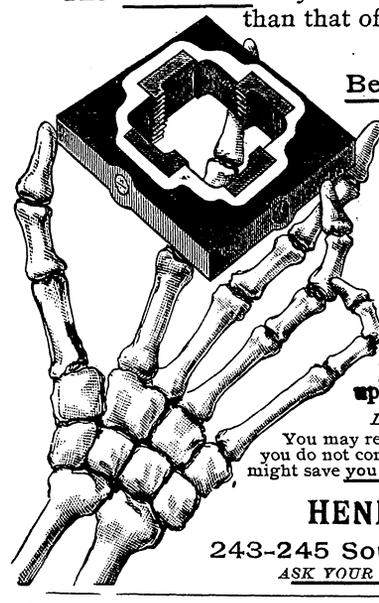

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

A sample One-inch "Skeleton" Pipe Die, either 2⅜ or 2½ x ¾ thick, by mail, postage prepaid, will cost you **62 cents,** and will be sent upon receipt of a Postal note for that amount.

DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

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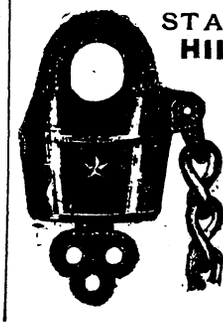

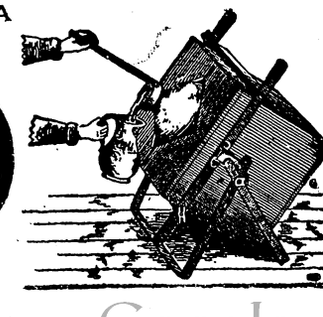

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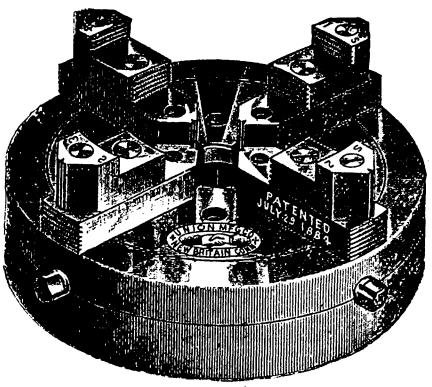

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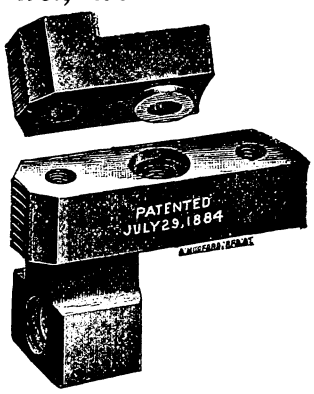

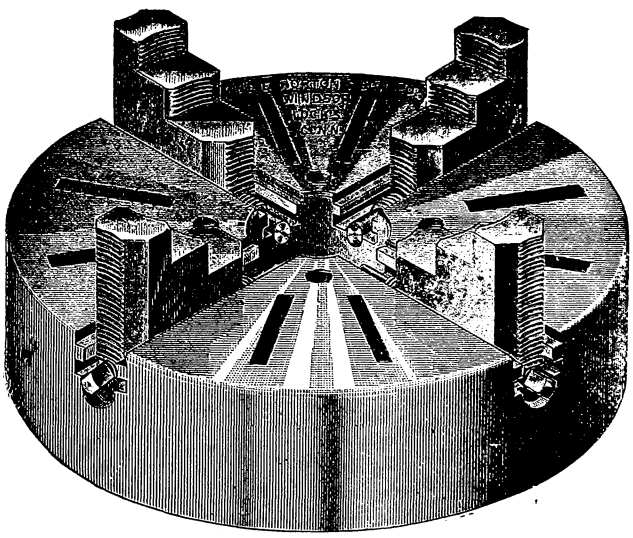

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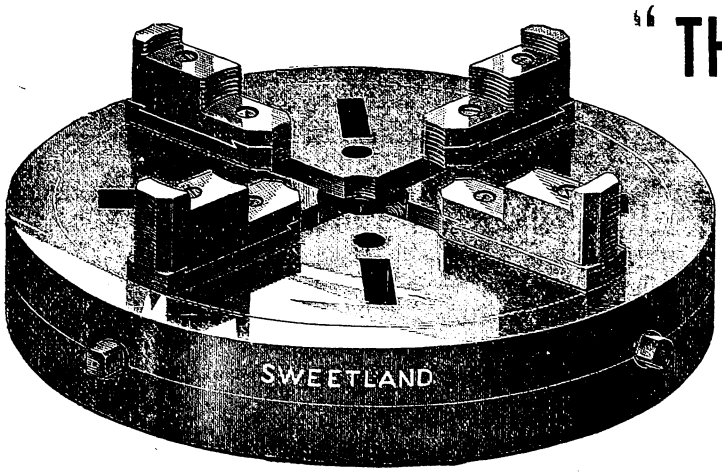

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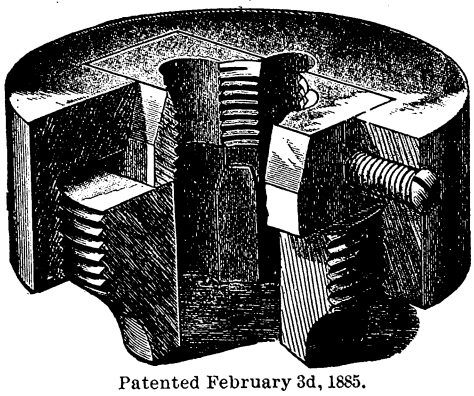

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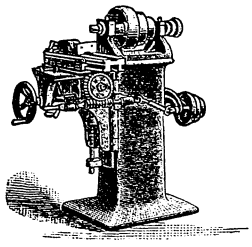

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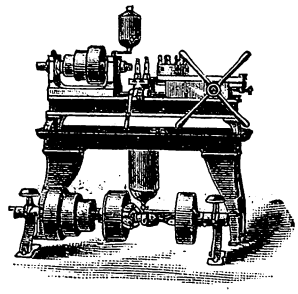

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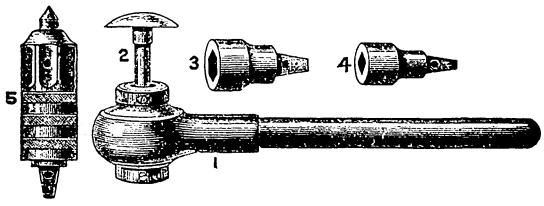

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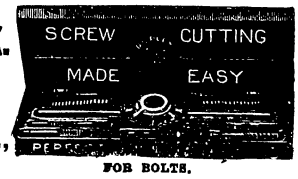

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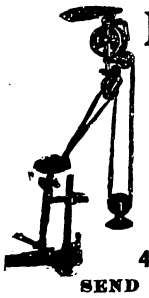

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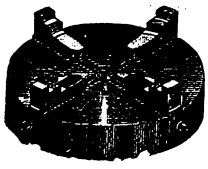

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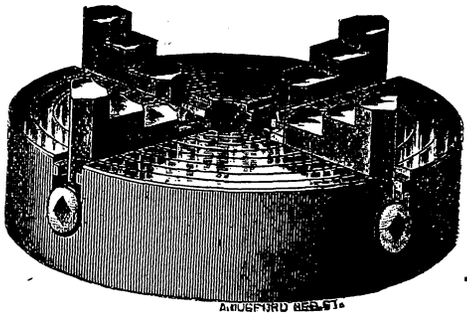

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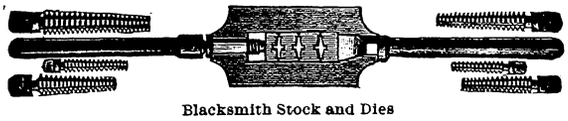

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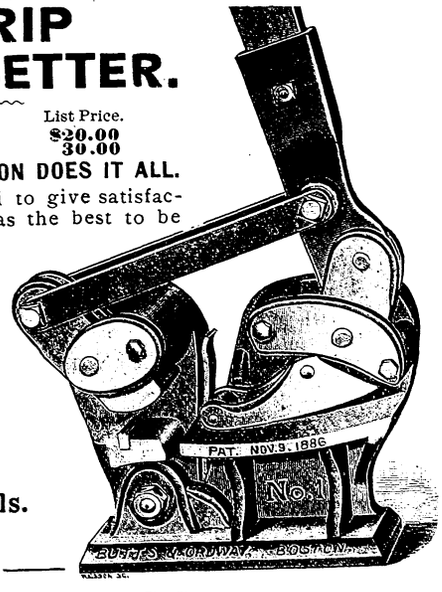

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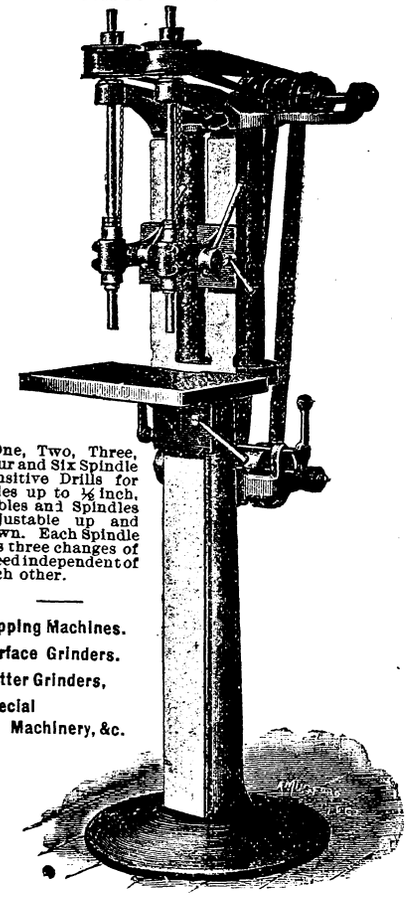

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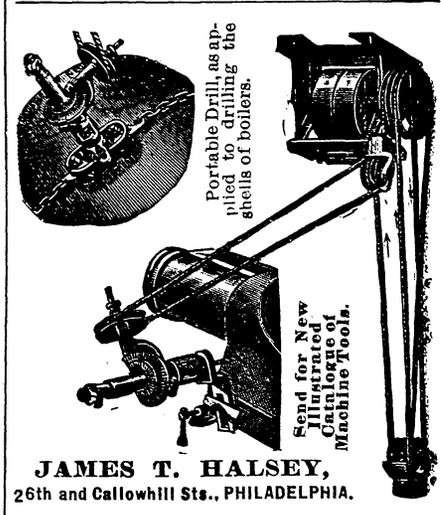

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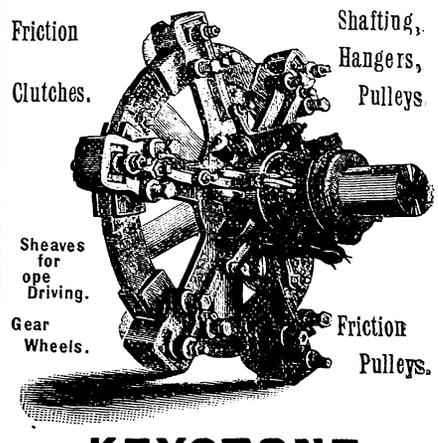

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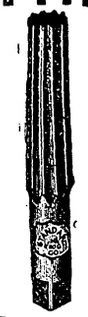

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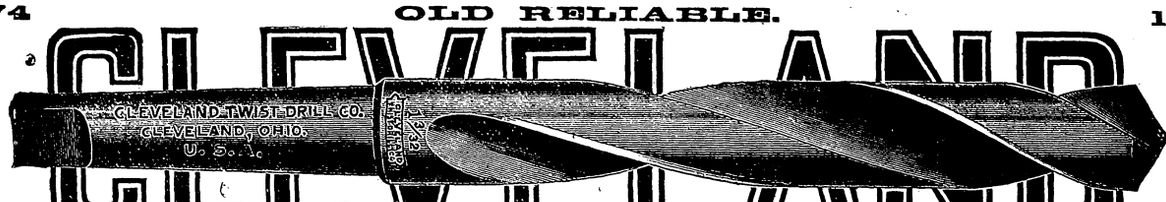

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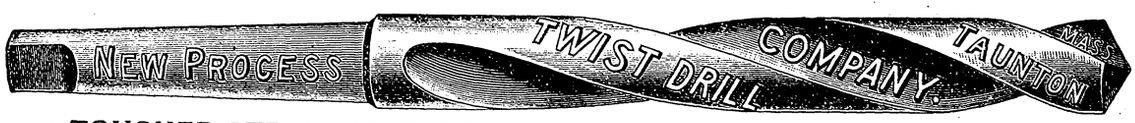

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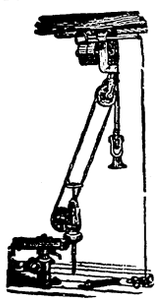

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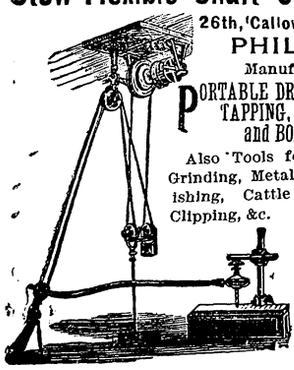

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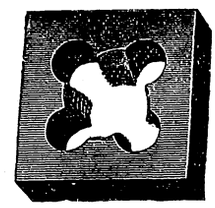

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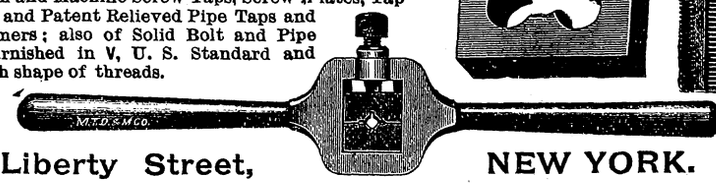

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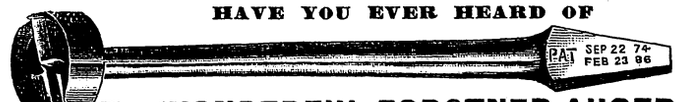

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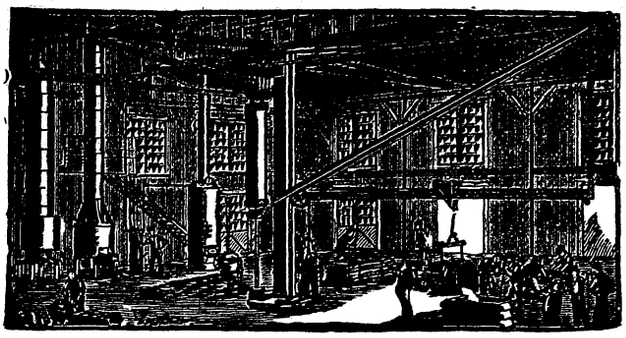

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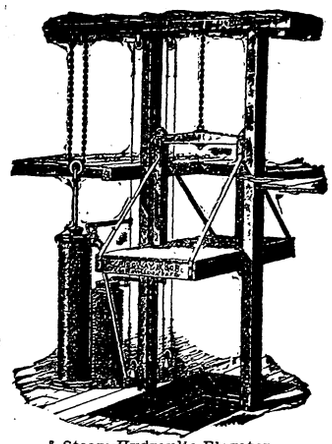

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Enclosed find clipping from the Sharon, Pa., *Telegraph*, of June 24, giving an account of an accident at our works which *fearfully* demonstrates "The Unexpected in the Foundry." A sixty-ton heat was in progress of being run off and at the second lifting of the crane ladle, the hoisting chain parted and let the ladle drop five feet, striking the side of the cupola's ladle pit, and throwing the metal over the body of George Miser. Though almost enveloped by seething fluid iron, he retained his senses, and while attempting to crawl out of the metal was grasped by two men, who were horrified to find his skin come off at every touch. The unfortunate man lived three hours. It is the first serious accident I have had under my management of heavy work, for 24 years in the foundry. It took two and a half hours to resume melting, and after running down what iron remained in the cupola, the bottom was dropped. The chain which broke was best English make, and tested to lift 20 tons with safety. Its load at the time of the accident was about five tons. This suggests the query, *Why do chains generally break with the lighter loads?* This, I think, is the experience of others as well as myself. Yours truly, THOS. D. WEST.

Sharpsville, Pa., June 26, 1893.

The Ridgway Steam-Hydraulic Crane saves such accidents. In our crane the load is held by four separate and independent short chains, two at each end of the jib. Each of these chains is amply heavy to alone safely support the load. The breaking of a single link will not allow the load to drop. Two chains must break at the same end at the same moment to drop the load. An impossibility. Our crane cannot be overloaded, as diameter of cylinder fixes the maximum load. If there is such a thing as Perfection in a machine, it is found in our Steam-Hydraulic Crane. Of the large number in use in the best Foundries all over the land, the universal verdict is that it is

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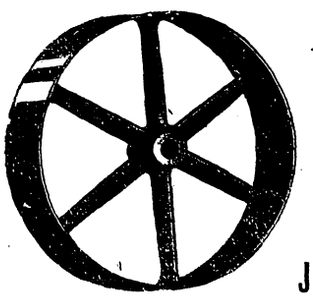

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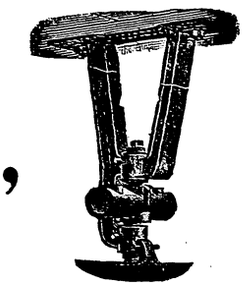

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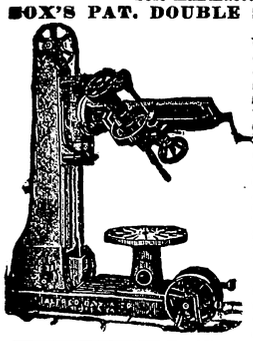

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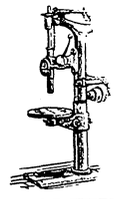

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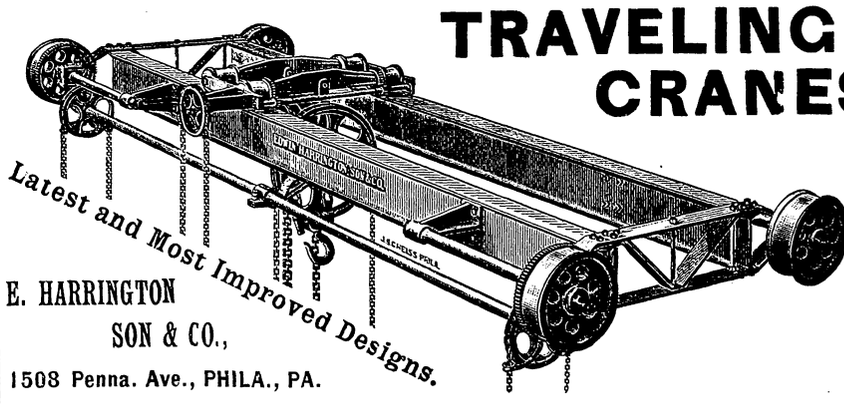

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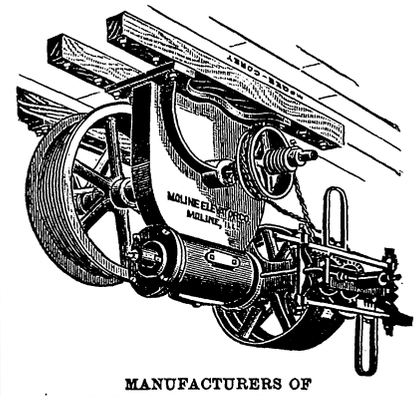

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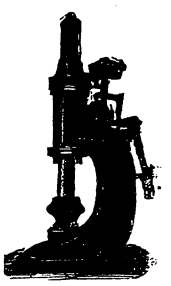

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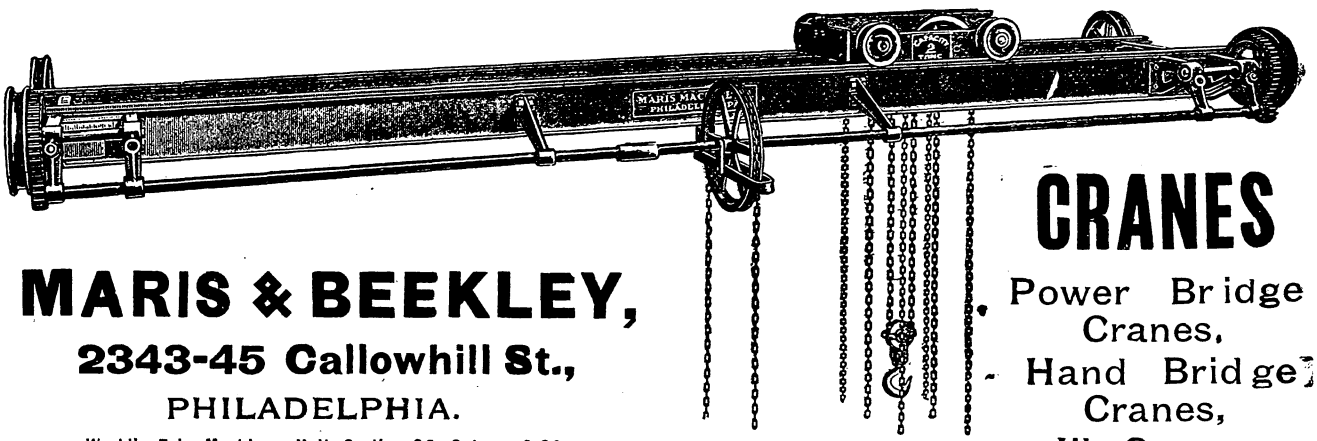

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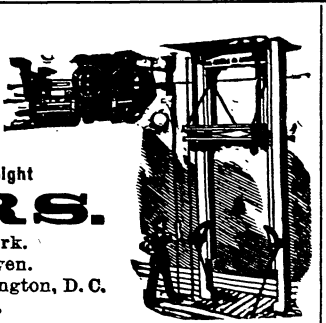

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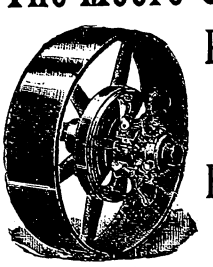

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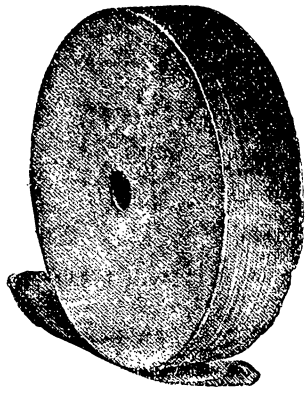

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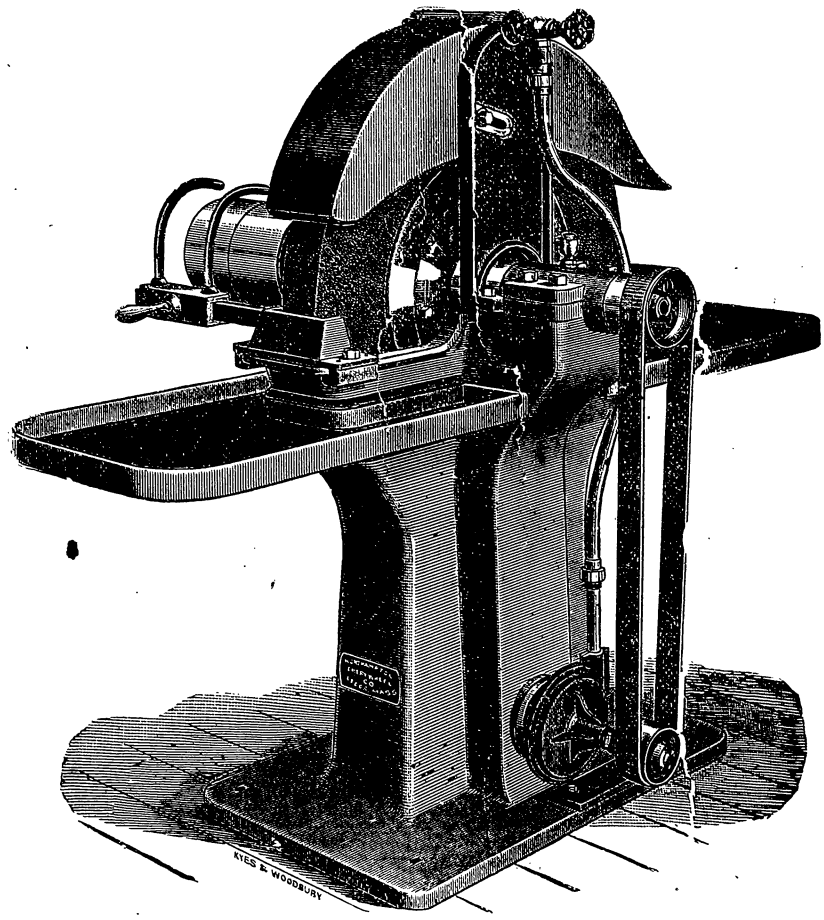

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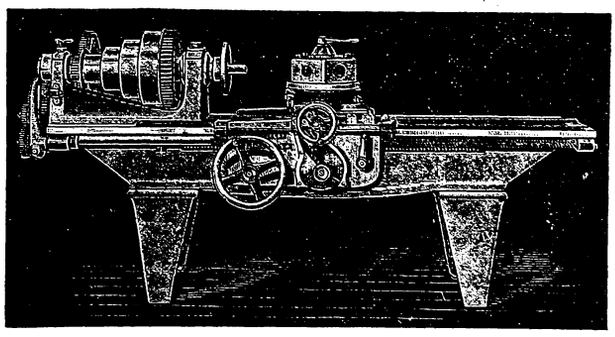

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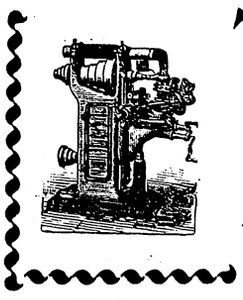

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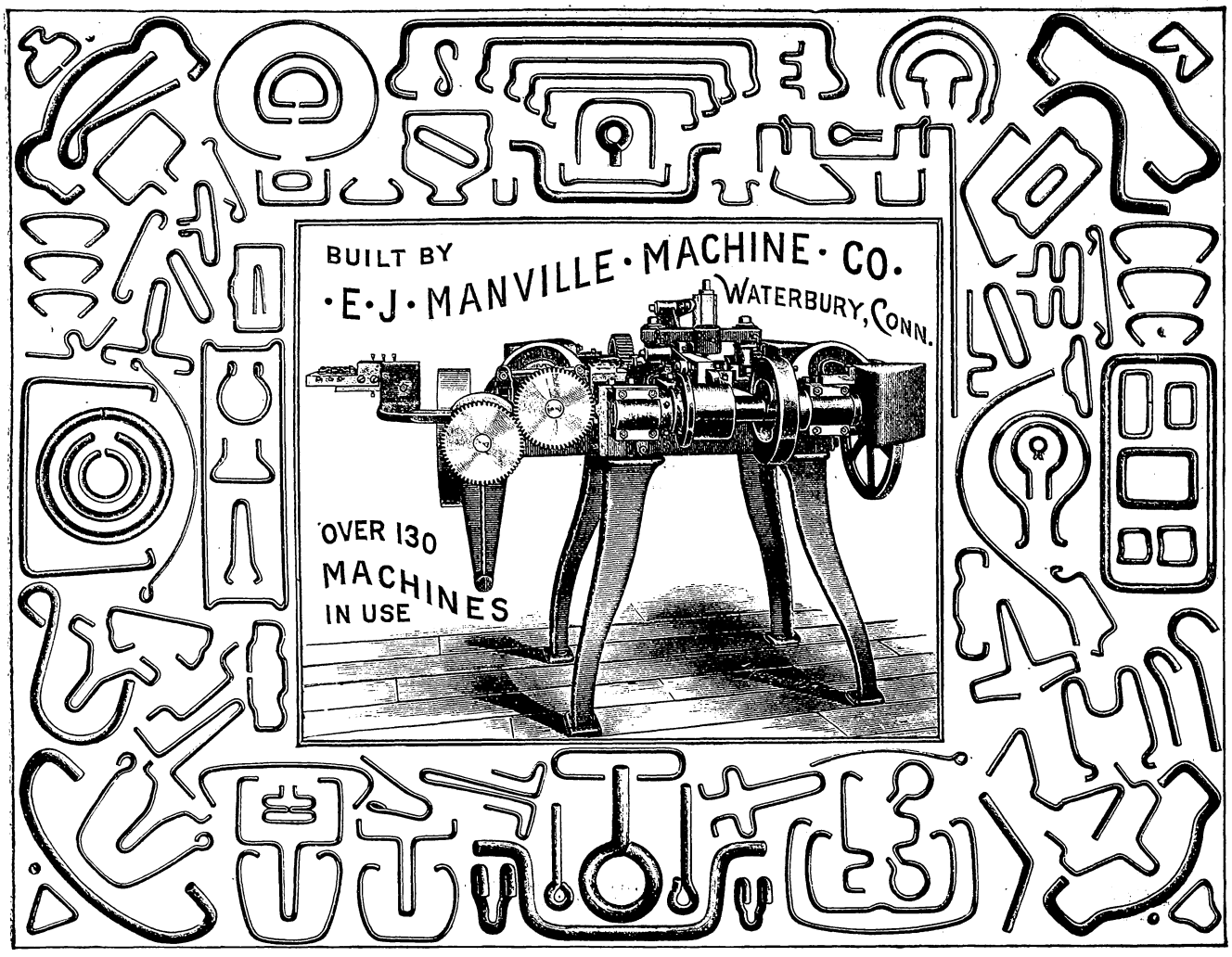

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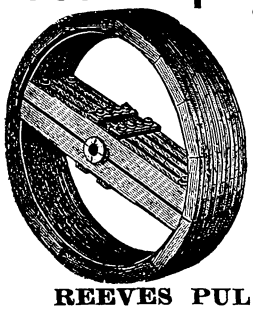

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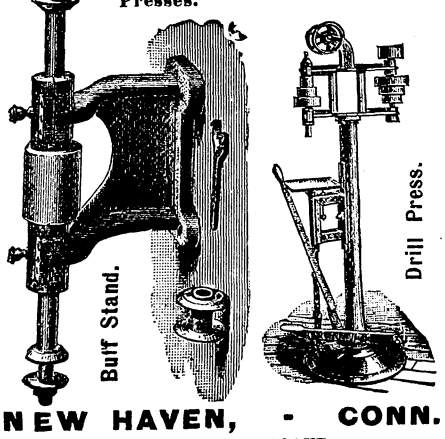

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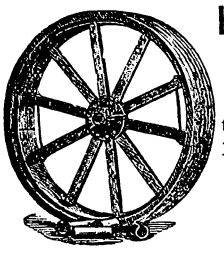

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16 in. x 8 ft. " " " " "
16 in. x 8 ft. Flather " " " "
16 in. x 8 ft. Dexter " " " "
17 in. x 6 ft. Fitchburg " " " "
17 in. x 8 ft. " " " " "
18 in. x 8 ft. " " " " "
19 in. x 8 ft. " " " " "
20 in. x 7 ft. Flather " " " "
20 in. x 10 ft. Fitchb'g " " " "
20 in. x 9½ ft. Pond " " " "
22 in. x 10 ft. Flather " " " "
22 in. x 16 ft. Fitchb'g " " " "
24 in. x 8 ft. " " " " "
27 in. x 12 ft. " " " " "
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Prentice Upright Drill, 25 in. swing, back gear, power feed.
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19½ in. x 48 in. Beam Engine, with Knowles Condenser.

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Garvin Screw Machines.
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A line of second-hand Tools, also **small Electric Fan Motors.**

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50 Cast Iron Lamp Posts, fancy.
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Power Trip Hammers, Lathes, Milling Machines. Prices to suit buyer.

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GOOD VALUE.

1 Bausch Radial Drill, 36 in.
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Above are 2d hand.
1 Hendey Lathe, 21 in. x 10 ft.
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1 Upright Plate Shear, 15-inch blade; in first-class order.
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One 60 H.-P. Ide engine, one 80 H.-P. Ideal engine; one 125 H.-P. Ide engine; one Gordon & Maxwell steam pump, 5 x 3 x 5; one Gould steam pump No. 16; one 50 H.-P. Wainwright heater; one jack shaft, 4 7-16 in. x 15 ft. 6 in., with two pairs of flanged face couplings; four pulleys, 72 in. x 8½ in., and one pulley 72 in. x 7 in. All of this machinery is in good condition, the engines being as good as new.

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Nos. ¼, ½, 1, 6 and 7 Root's Pressure Blowers, in A1 order and cheap.
Also 15 horse-power Greenfield Upright Engine, good as new.

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WANTED.

To furnish reasonable estimates on specialties in light metal work.

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Assignee's Sale.

ASSIGNEE'S SALE.—The undersigned, Assignee of the Roelker Stove and Plow Co., of Evansville, Indiana, by order of the Superior Court of Vanderburgh County, Indiana, will, on the SIXTH DAY OF SEPTEMBER, 1893, on the premises of said compamy, on Main and Sycamore streets, between Fifth and Sixth streets, commencing at 10 o'clock a.m., and continuing until all said property is disposed of, sell all the real and personal property of said corporation, consisting of plows, stoves, castings, patterns, flasks, tinners' stock, raw material for the manufacture of stoves and plows; also all tools and machinery used in the manufactory. The above property will be sold for CASH.

The property to be sold is one of the best equipped plants for the manufacture of stoves and plows in the West. The buildings have been erected and machinery placed with especial reference to the business, and everything is in perfect condition to continue the business.

The Roelker Stove and Plow Co. is widely and favorably known and its stoves and plows are in great demand—a purchaser could not only purchase a thoroughly equipped plant, but could also secure the good will of a thoroughly advertised business of thirty-eight (38) years' active operation. The property will be sold at public auction to the highest bidder. If purchaser cannot be found for the entire plant, then it will be divided and sold in such quantity as may secure the best returns.

No better opportunity was ever offered for a profitable investment.

In the meantime propositions will be received for private sale of all or part of above described real estate, and also for either or both the stove and plow manufacturing business, with all its manufactured stock, raw material, patterns, machinery, tools, &c., connected with the above-named business. Address

JOHN H. POLSDORFER,

Assigneee,

Evansville, Ind.

Any Manufacturer

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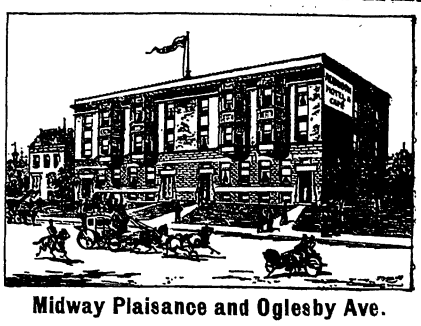

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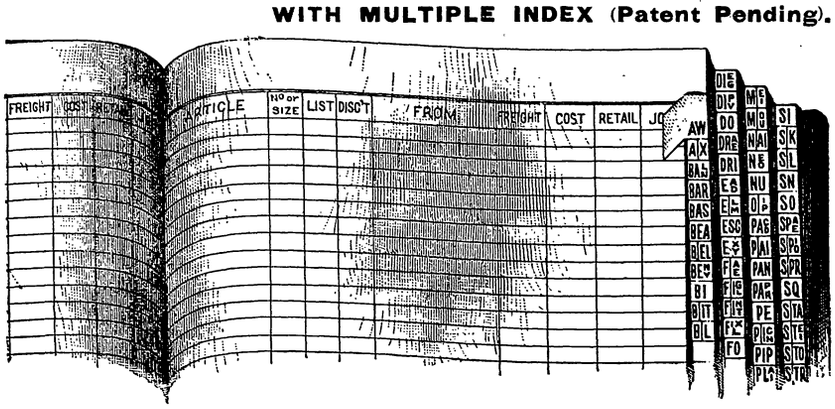

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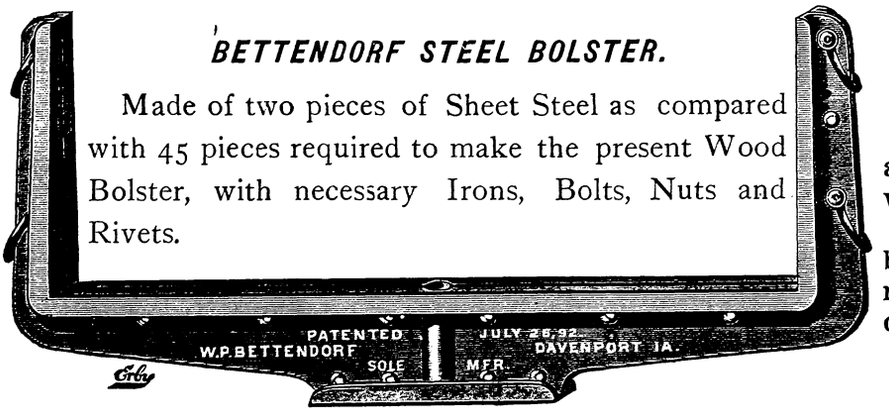

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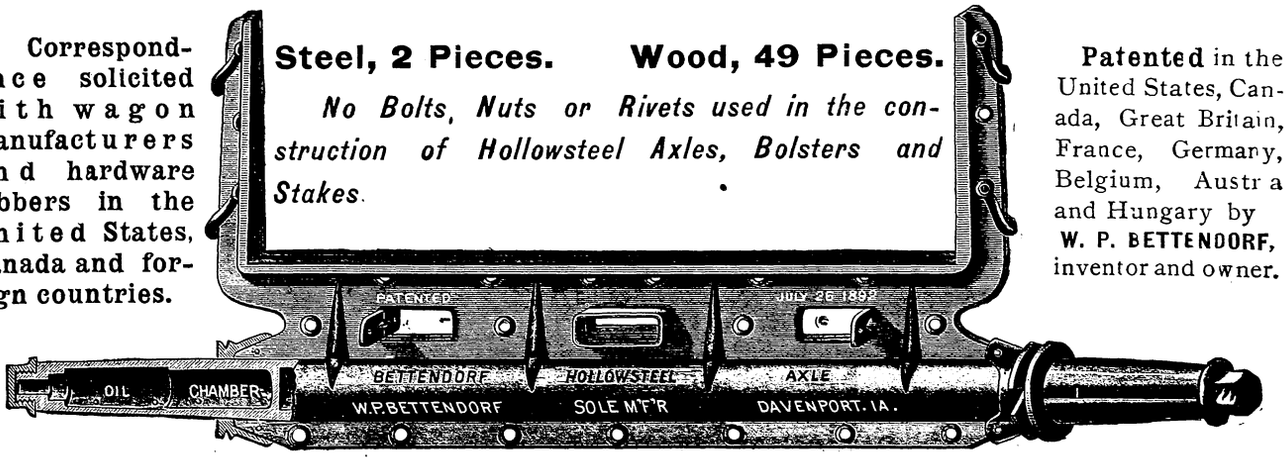

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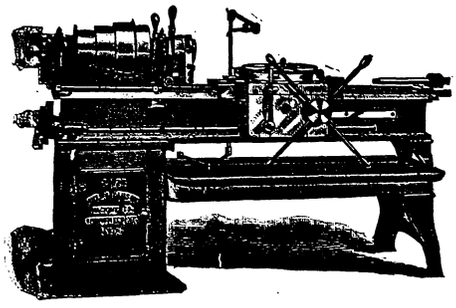

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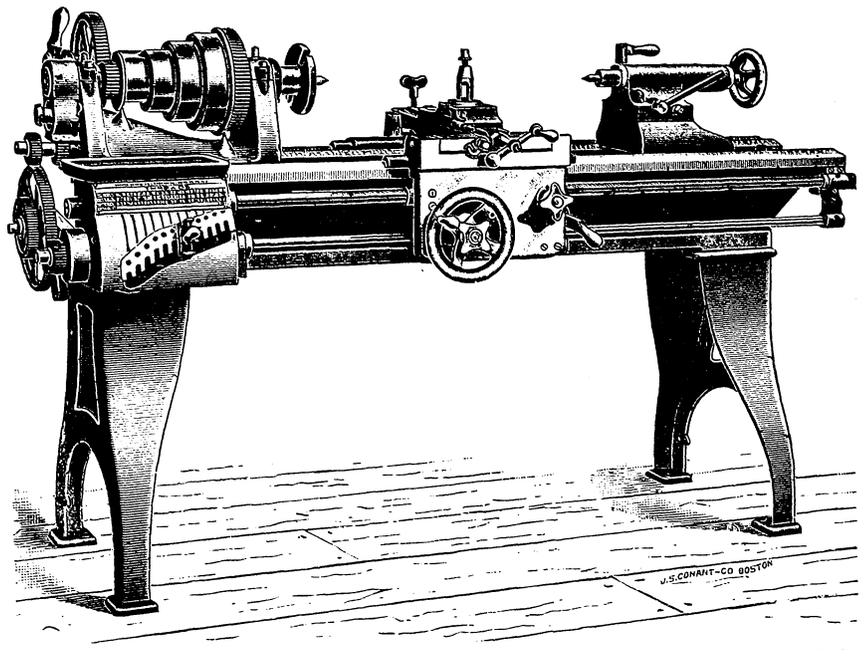

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THE OLD RELIABLE STANDARD FREEZER

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The Gem Freezer
The Best in the World.

The simplest, neatest, most convenient and satisfactory for family use, and the leader of all Ice Cream Freezers of established reputation Imitated by all, equaled by none. Always in the lead.

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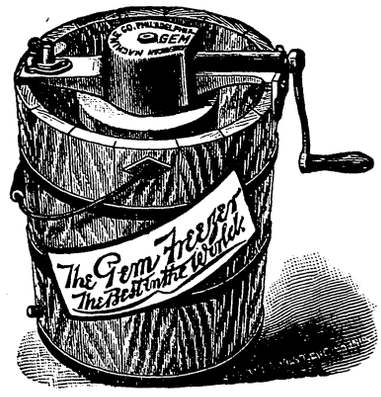

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ROUSE, HAZARD & CO., 146 G St., Peoria, Ill.
Manufacturers, oldest and largest jobbers in U. S.

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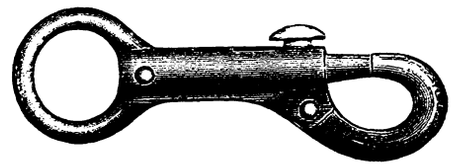

This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substance and freezing, and is lower in price

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Stanley's Steel Butts & Hinges,

AND INSIST ON HAVING THEM.

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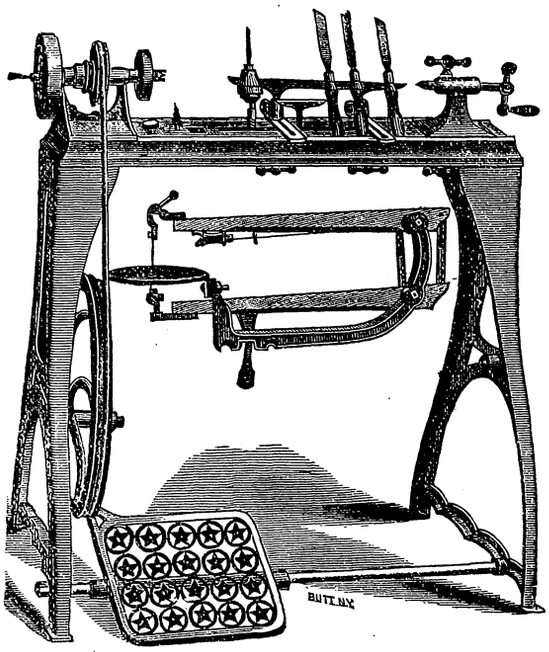

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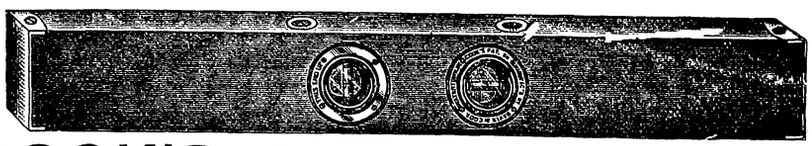

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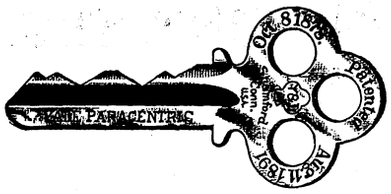

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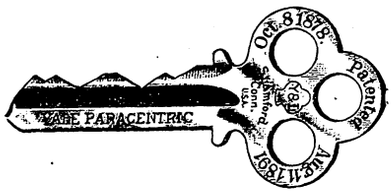

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MAKES FRIENDS and MONEY, and
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And the people are right.

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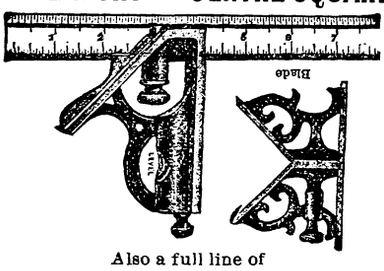

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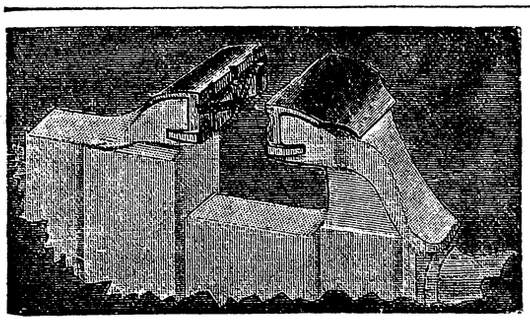

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Will Fit any Kind of Vise.

For protecting finished work. Will hold finished rods of any shape without injury.

3½ inch, ...per pair, 40 cents.
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A LARGE CAPACITY, AND EASY WORKING PUMP FOR

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Fig. 120.

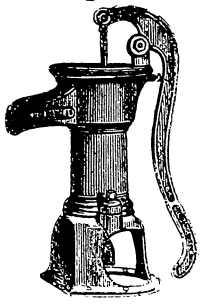
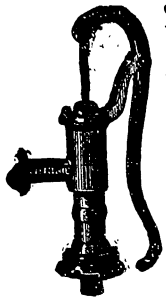


Fig. 76.



or wherever it is desired to raise a large quantity of water by **hand power.**

The pump has large valves (accessible by hand) and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

Capacity from 3,000 to 4,500 gallons per hour.

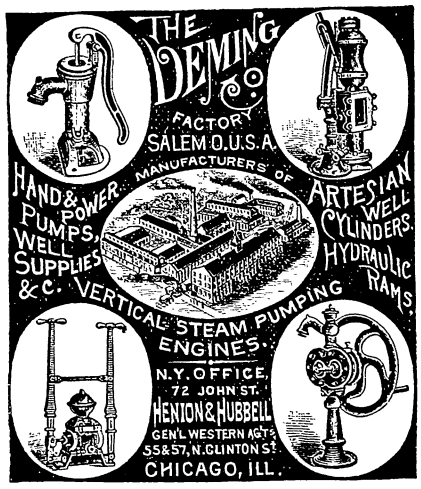
These pumps are simple, durable and low priced.

Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

Send for Circular and Price List.

Fig. 209.

Fig. 361



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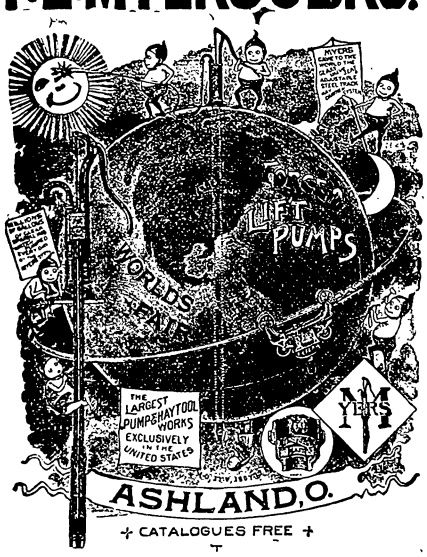

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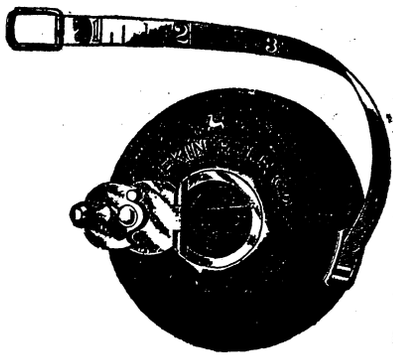

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Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval. We carry a complete stock of our goods at our New York Office, 20 Murray St.

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Lightning Band for Cases and Crates.

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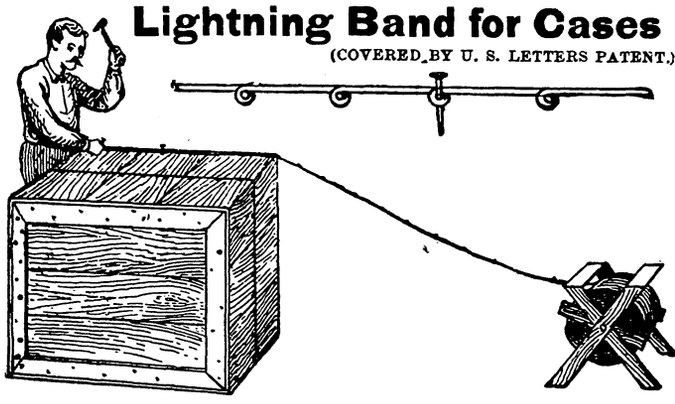

Mounted on reels and always ready for use and convenient to handle. Easily and quickly binds shipping cases and crates in a neat, strong and substantial manner.

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No. 1, per reel of 2000 ft., $4.50 net.
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Plyers for cutting wire, 50 cents extra.
No. 1 for cases under 300 or 400 pounds, and No. 2 for all heavier cases.

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Sole Manufacturers,
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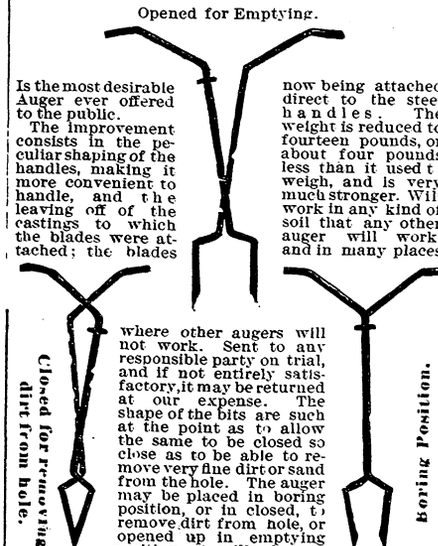
Opened for Emptying.



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The improvement consists in the peculiar shaping of the handles, making it more convenient to handle, and the leaving off of the castings to which the blades were attached; the blades now being attached direct to the steel handles. The weight is reduced to fourteen pounds, or about four pounds less than it used to weigh, and is very much stronger. Will work in any kind of soil that any other auger will work, and in many places where other augers will not work. Sent to any responsible party on trial, and if not entirely satisfactory, it may be returned at our expense. The shape of the bits are such at the point as to allow the same to be closed so close as to be able to remove very fine dirt or sand from the hole. The auger may be placed in boring position, or in closed, to remove dirt from hole, or opened up in emptying position at will of operator, without the use of any spring or removing his hands from handles. Nothing like it; nothing equal to it. It is made in all sizes from five inches up to ten inches. Get prices and discounts at once.

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CHAIN PUMPS,

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BECAUSE:

They do not rust and accumulate filth—always clean. Extreme lightness is combined with strength and durability. No freezing. No waste of water by reason of enlarged reservoir at top of tubing. No annoying wheel at bottom. Easy to handle.

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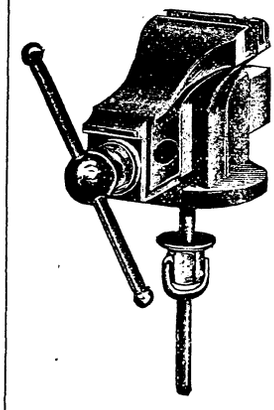

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Specially adapted for drill press work where chucks cannot be used and equally good for special or regular bench work.

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IRON BENCH LEVEL

WITH DOUBLE PLUMB.

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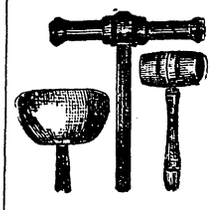

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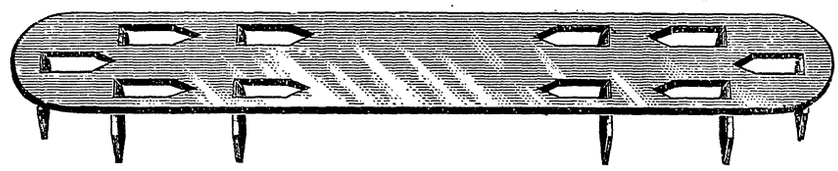

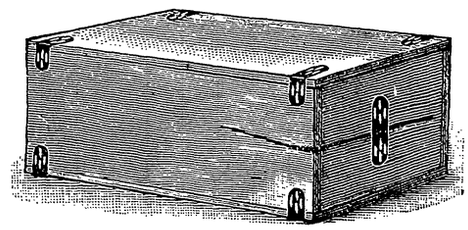

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Retail Stock contains 147 Spools

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A man who has made a reputation for his goods knows its value as well as its cost and will maintain it."—HENRY DISSTON.

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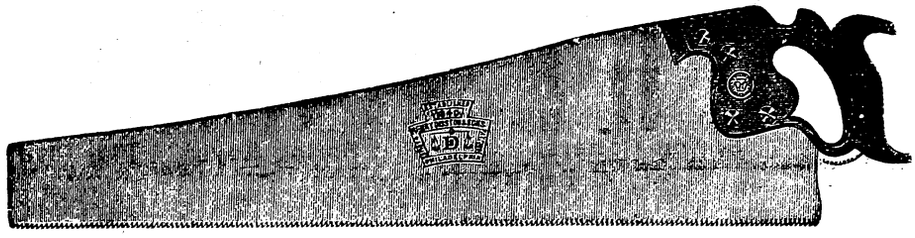
"THE SAW;" HOW TO CHOOSE IT, AND HOW TO KEEP IN ORDER, Sent Free on Receipt of Name and Post Office Address.

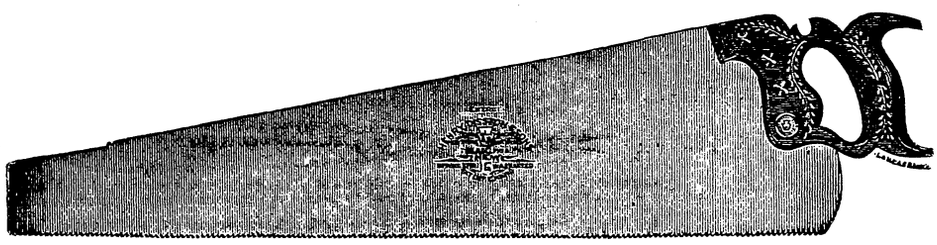
DISSTON & SONS' PATENT D-8 HAND SAW.



This Saw combines all the valuable improvements in Hand Saws that have been made by us of late. The first and most important is the hollow or skew back, the success of which can best be attested by the number sold. The peculiar shape of the butt or heel, coupled with the new method of fastening to the handle, give a full stroke of the blade without fear of catching or hooking in the work ; and as the handle is put further on the blade you have a full stop on the proper point and a greater command over your Saw, by reason of being two inches nearer the point, which must give more power.

The Saw being let into the handle on a circle, has a perfect bearing, which, with the new screws, makes it stronger and almost impossible to work loose, and avoids the unsightly gap that is seen on the back of the old style handle. All the above features are patented.

Our New No. 16 Premium Saw.



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Having the Latest Close up Handle, Spring Steel Blade, Extra Thin Back, Finely Grained, with an Apple Handle and Four Brass Centennial Screws.

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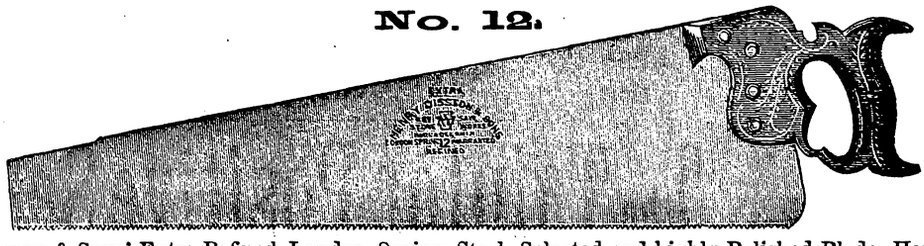
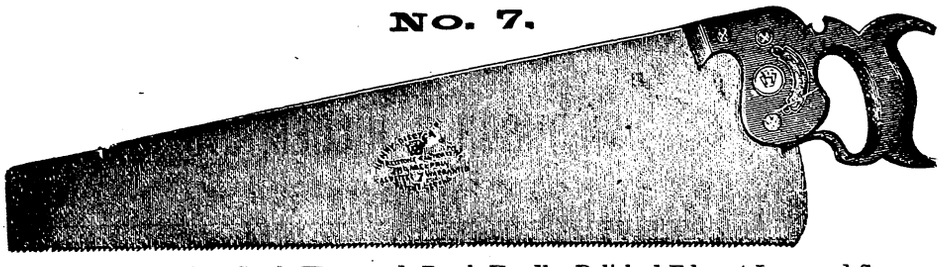


DISSTON & SONS' Extra Refined London Spring Steel, Selected and highly Polished Blade, Handle Carved and Polished, 4 Improved Brass Screws, the finest Hand Saw manufactured.

No. 7.



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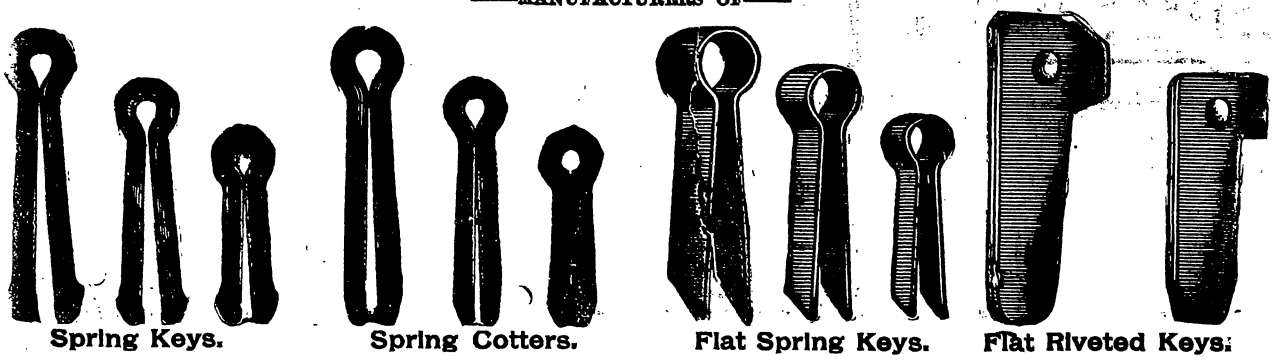

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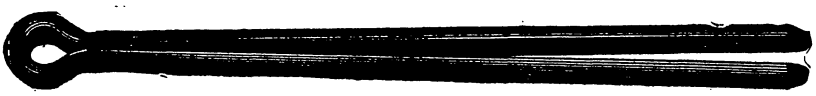

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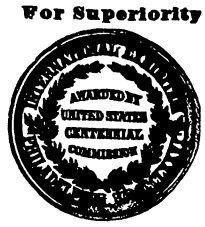

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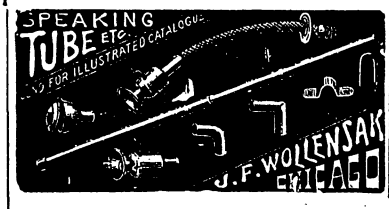

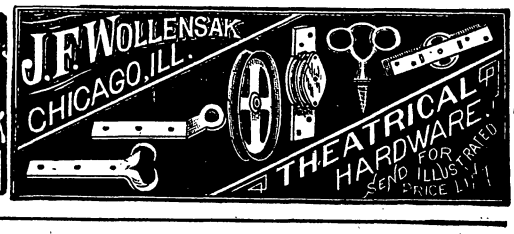

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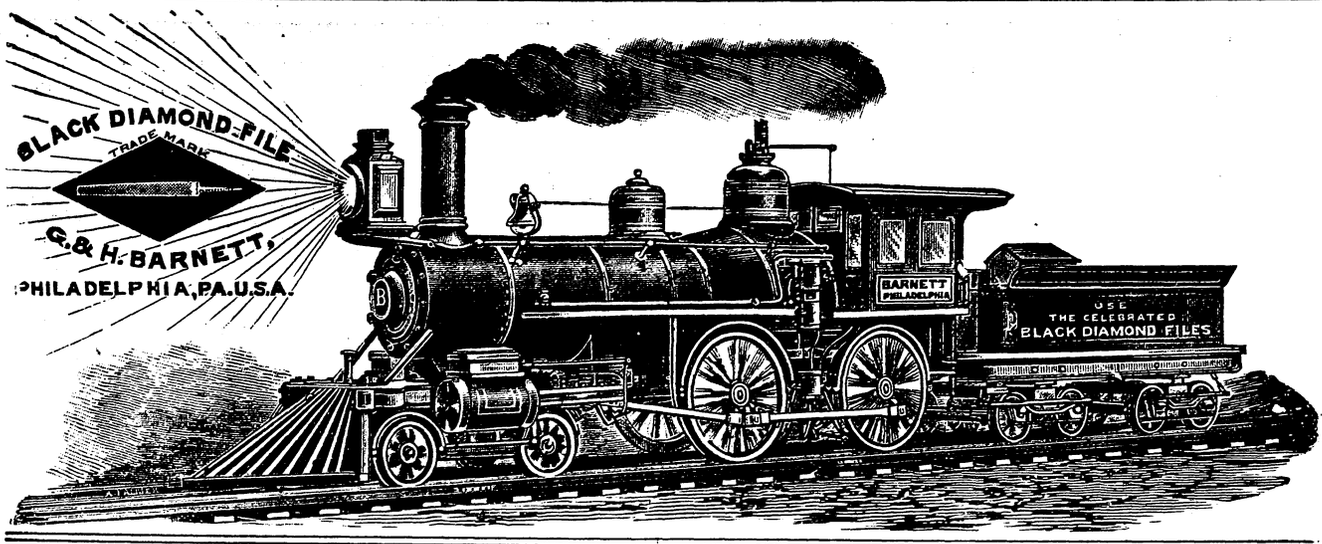

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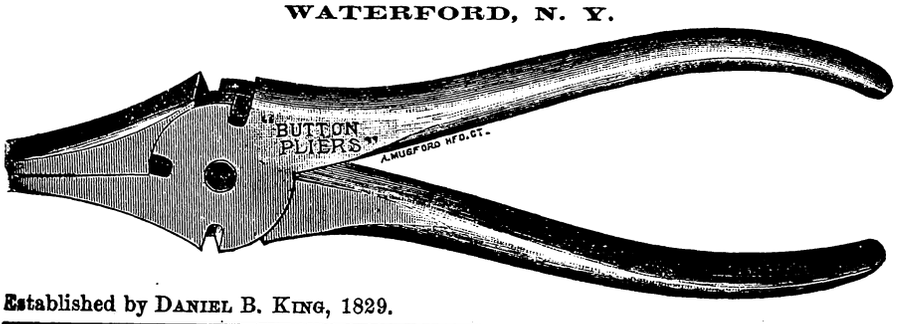

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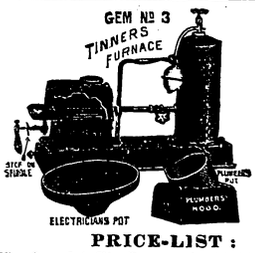

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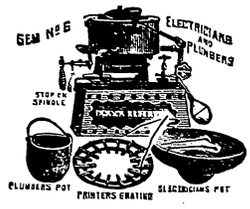

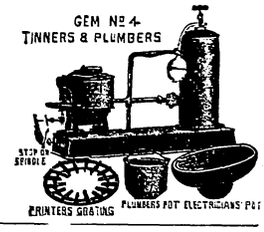

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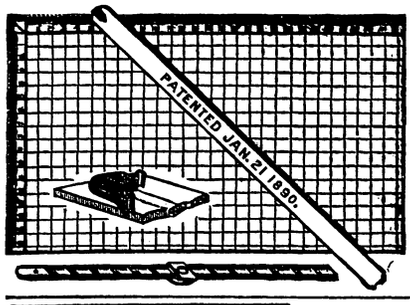

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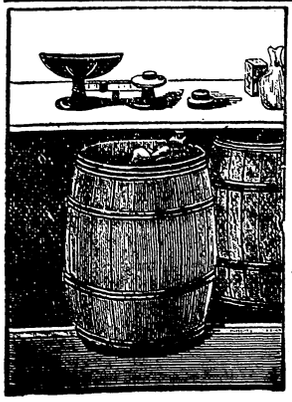

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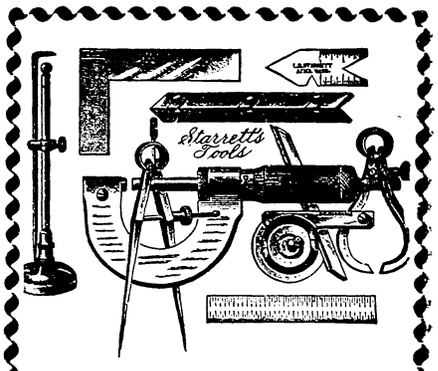

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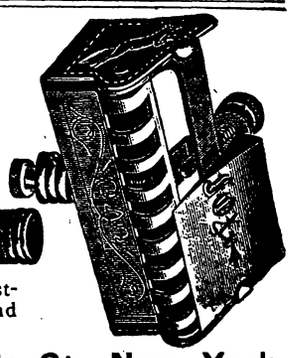

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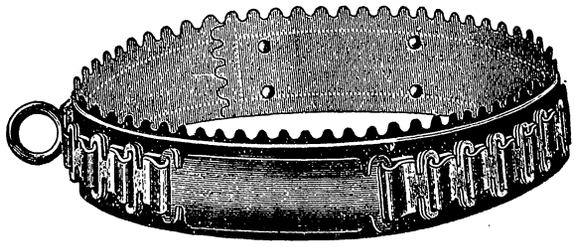

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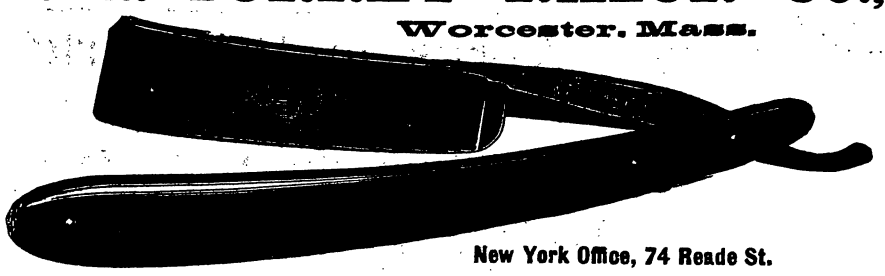

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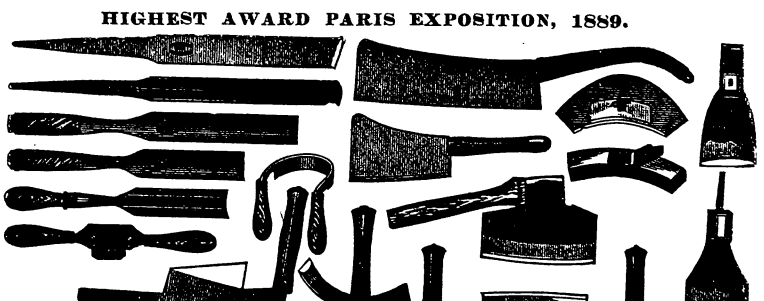

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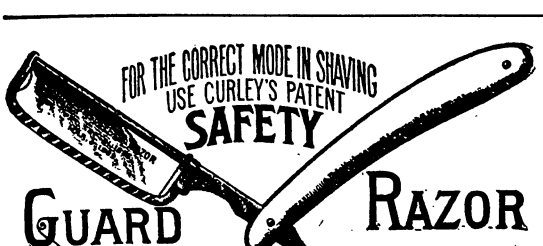

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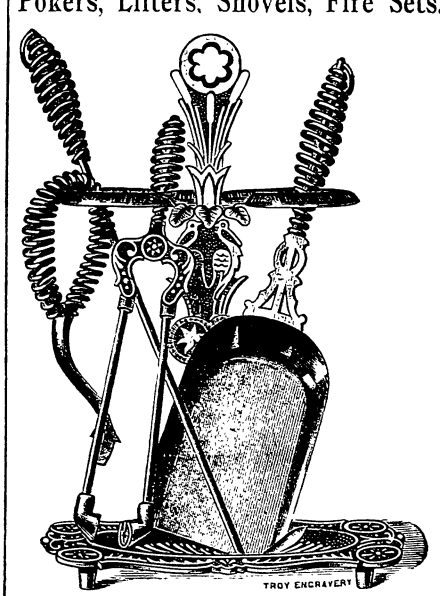

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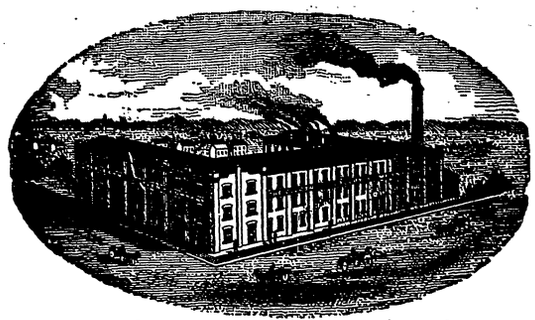

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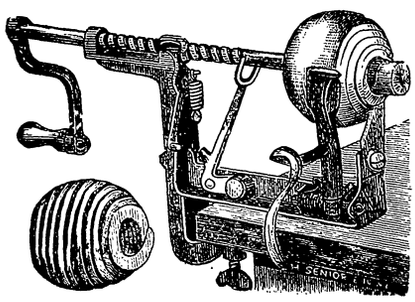

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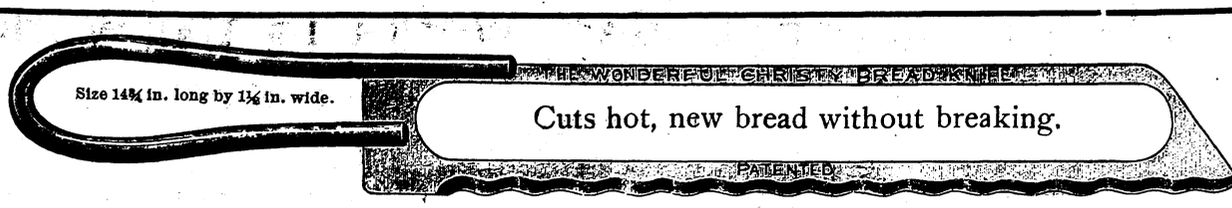

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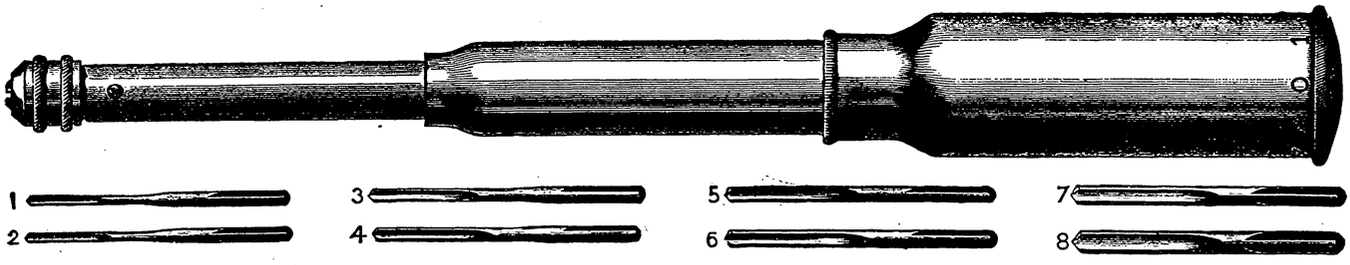

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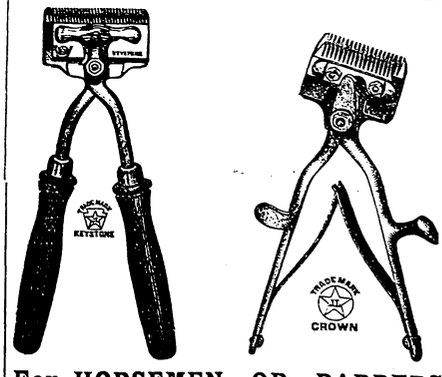

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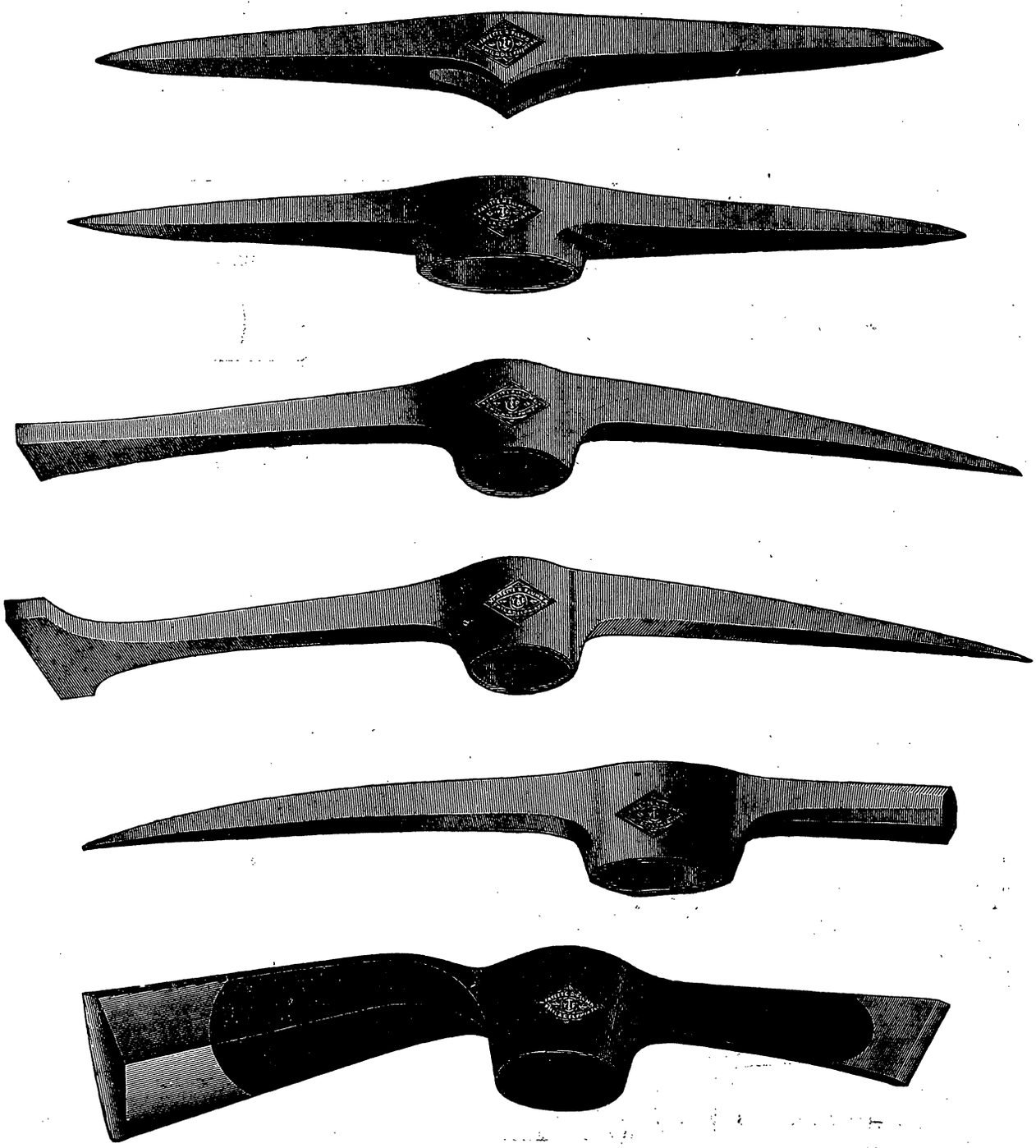

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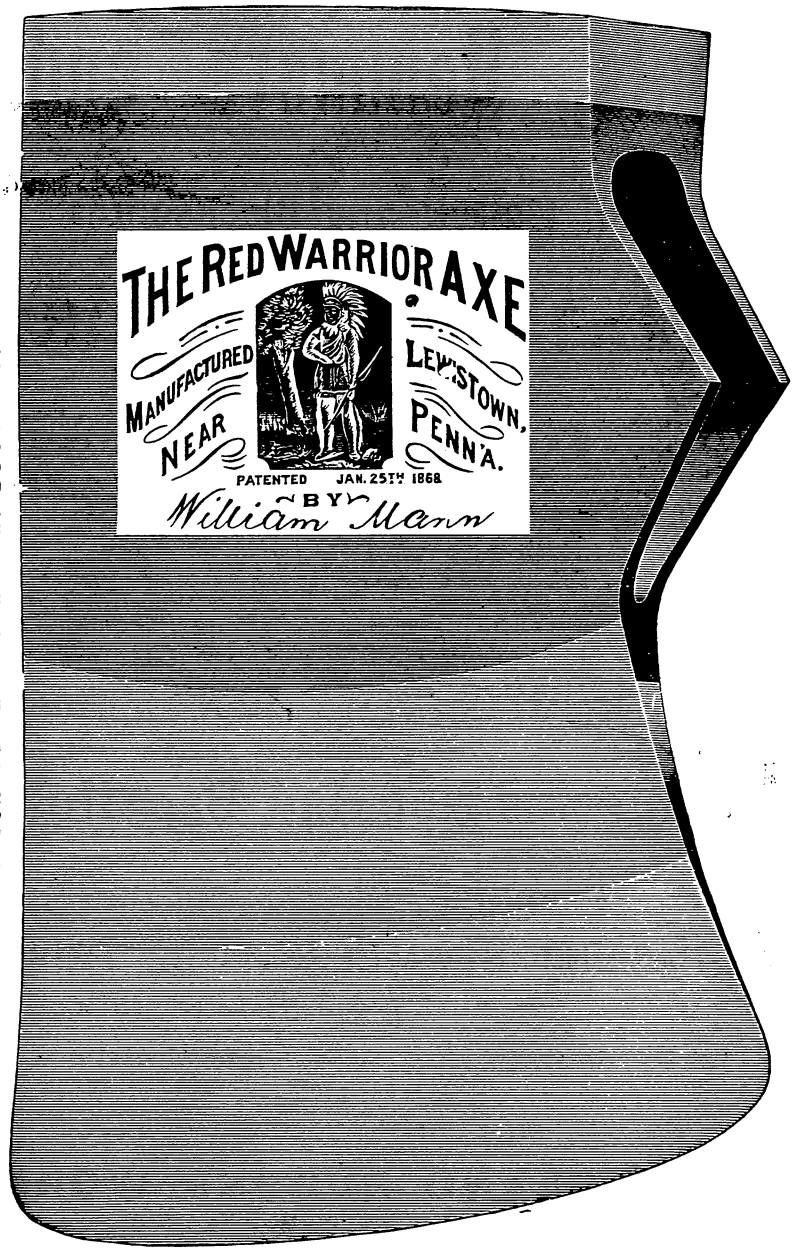

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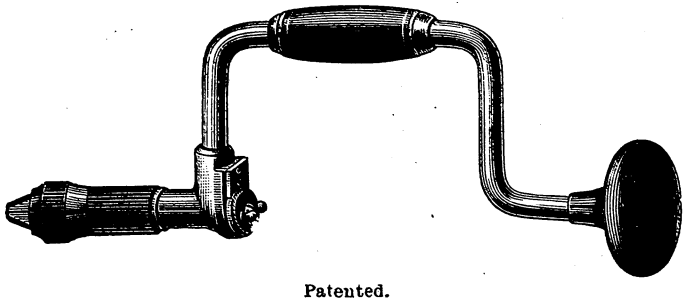

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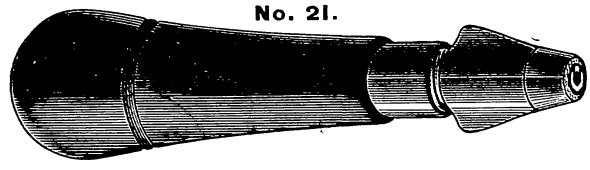
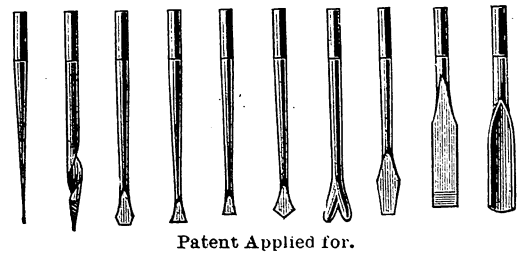
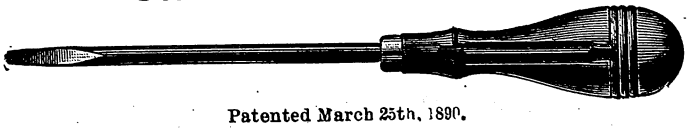




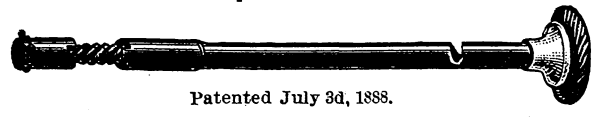
Patent Applied for.

Standard Screw Driver.



Patented March 25th, 1890.

Standard Spiral Screw Driver.



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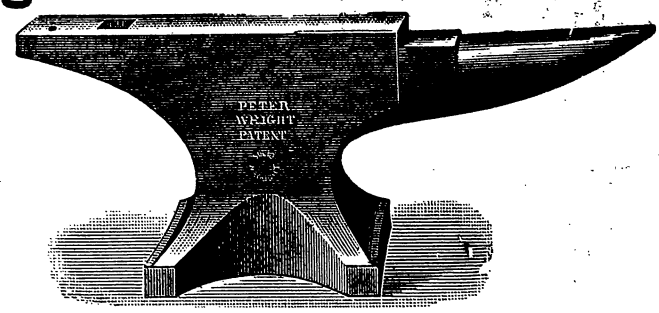

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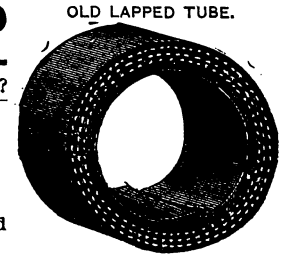

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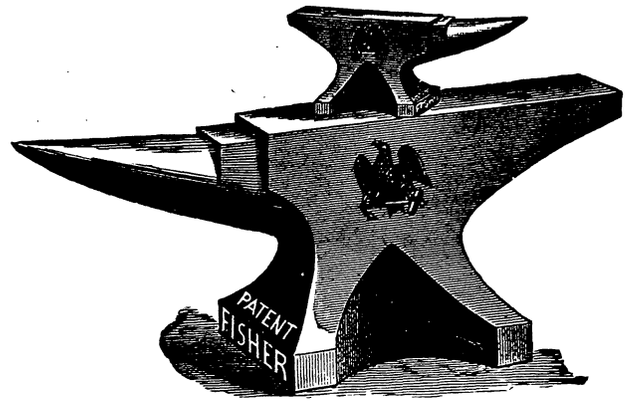

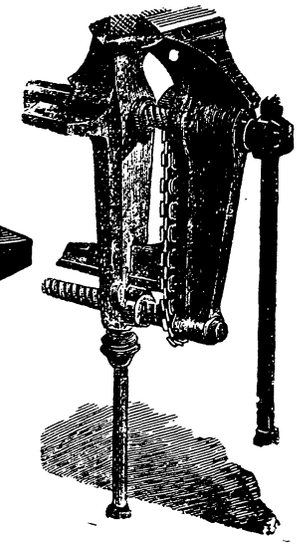

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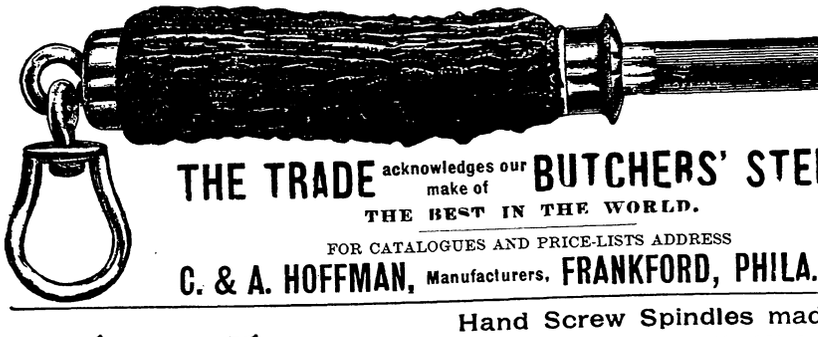

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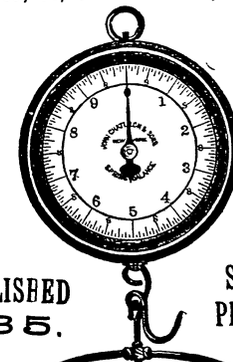

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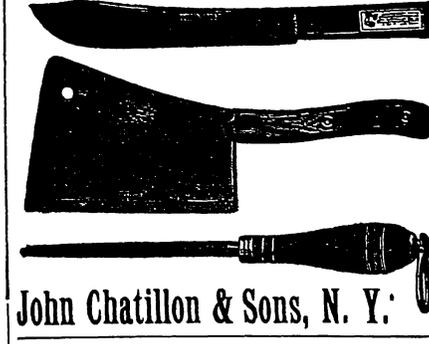

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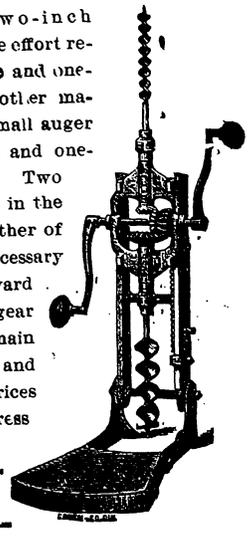

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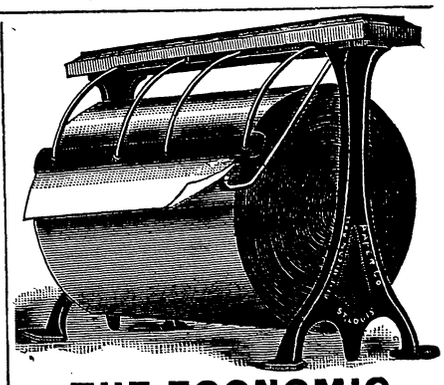

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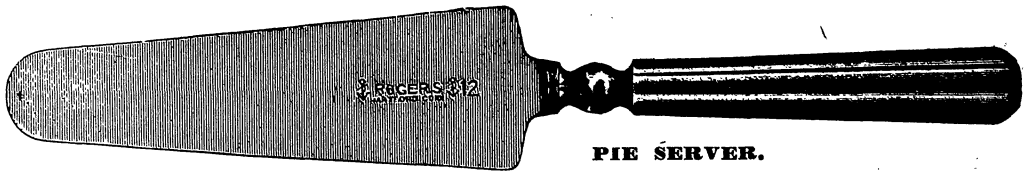

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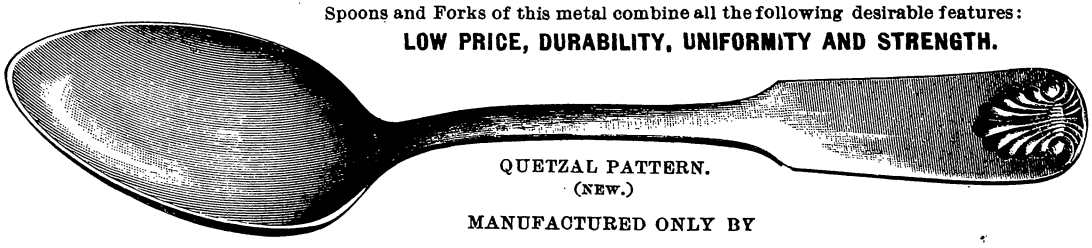

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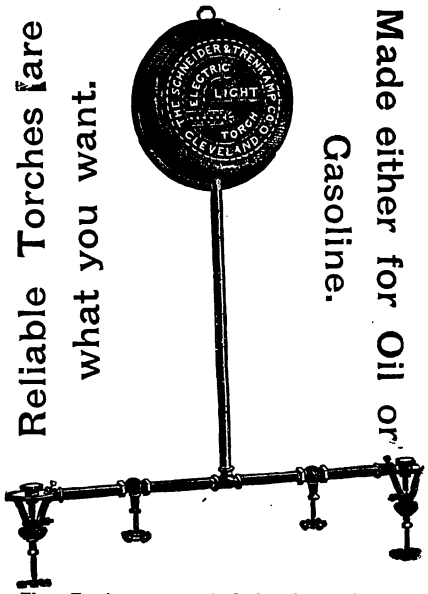

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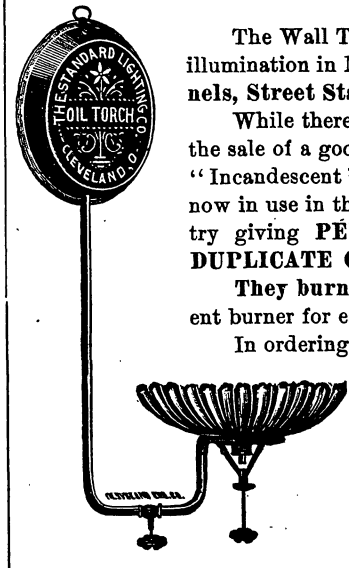

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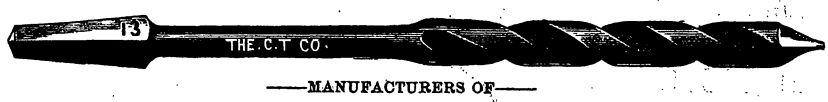

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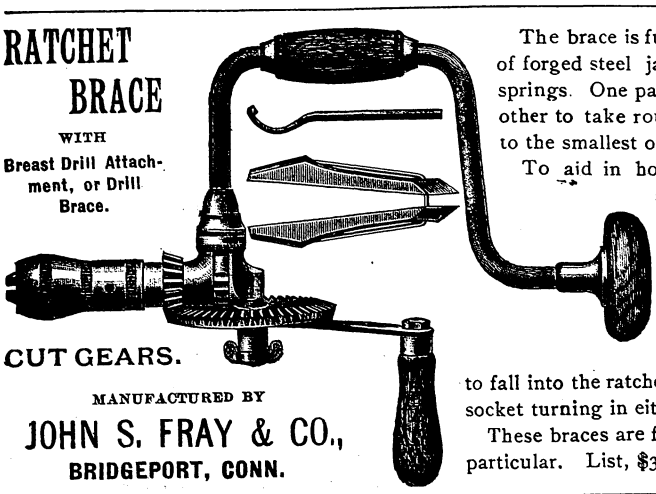

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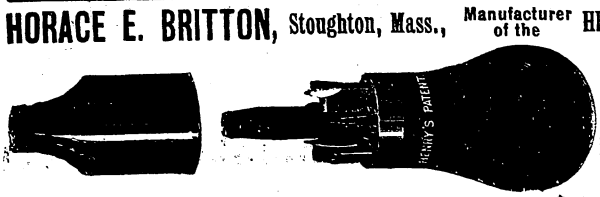

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THE GEM SOLID STEEL MINCER

Single and Double Blades.

Handle and Blade Formed in one piece.
Always Clean. Indestructible.
No Rivets to Wear Loose.
No Wooden Handle to Shrink, Swell, Loosen, Split, or Fill with Rancid Grease.

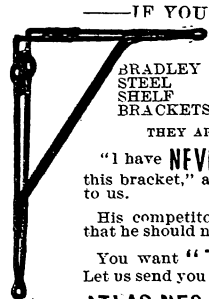
MANUFACTURED BY

PALMER HARDWARE MFG. CO.

TROY, N. Y.

Break it Down!!!

—IF YOU CAN.—



BRADLEY STEEL SHELF BRACKETS ARE STRONG, LIGHT, ARTISTIC, PROFITABLE.

THEY ARE GREAT SELLERS.

"I have NEVER HAD A CALL for this bracket," a certain dealer once said to us.

His competitor was taking good care that he should not.

You want "TO BE IN IT" this fall. Let us send you our catalogue and prices.

PAT. NOV. 8, 1892.

ATLAS MFG CO., New Haven, Conn.

SOLE MANUFACTURERS.

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MILWAUKEE, WIS.,

Manufacturers of the Best Charcoal "Sad Iron" in the world for Families, Dress and Cloak Makers and Tailors. Send for Circulars and Sample Irons. Agents wanted everywhere

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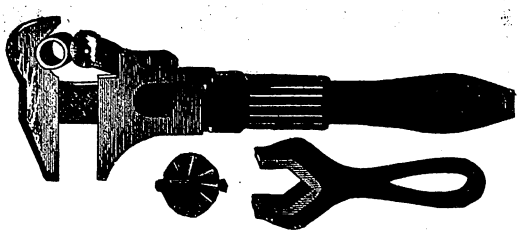
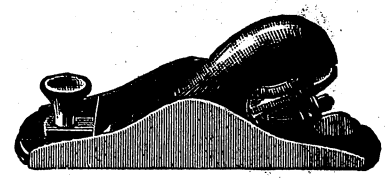
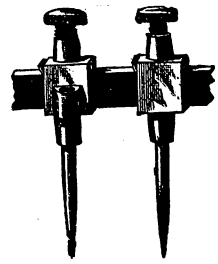
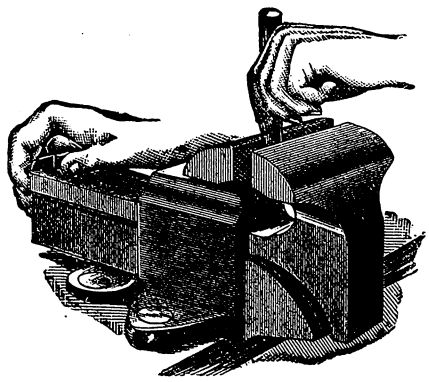


Donohue's Pat. Engineers' Wrenches, Short or Long Sleeve Nuts, and with Pipe Cutter.

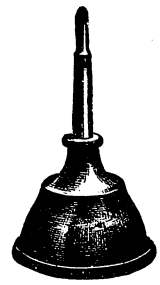


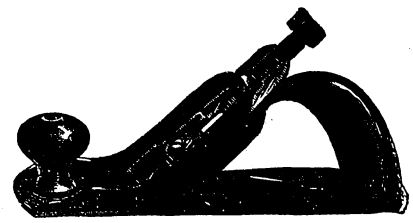


Chaplin's Patent Iron Planes, Corrugated Bottoms, Checkered Rubber Handles.



Stephens' Patent Vises, Quick Adjusting Cam and Toggle-Joint, Stationary or Swivel Base.





Challenge Iron Planes. Simplicity of Construction.

Boardman's Pat. Wrenches, Excelsior Expansion Bits, Whitney Drills, Baxter's Wrenches, Wood's Pat. Plumb and Levels, Devoe's Square Attachments, Gem Wrenches, Malleable Oilers and Lamps, Pencil Attachments.

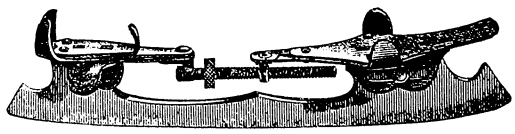
TOWER & LYON, Manufacturers, - - 95 Chambers St., New York.

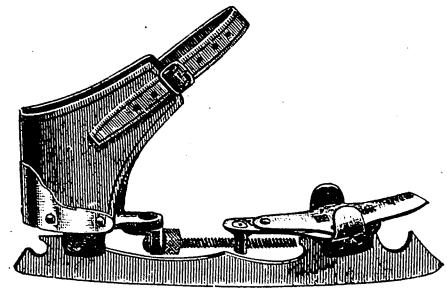
ICE SKATES

—MANUFACTURED BY—

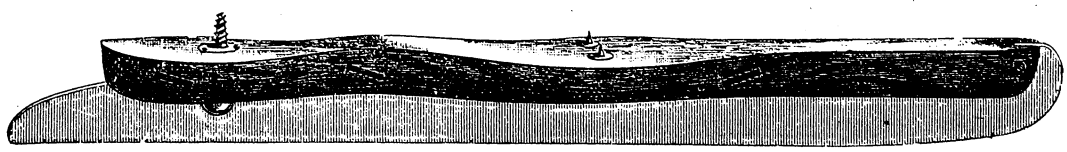
THE UNION HARDWARE CO.,

Torrington, Conn.





DONOGHUE RACING SKATE.



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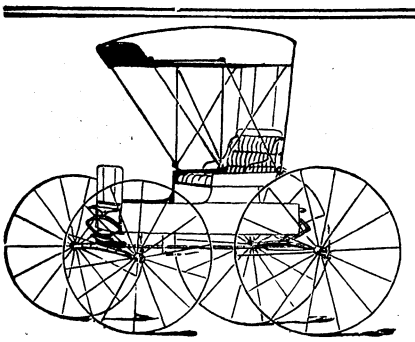

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Can buy this buggy for L. L. X X.
Retails for $75.00.

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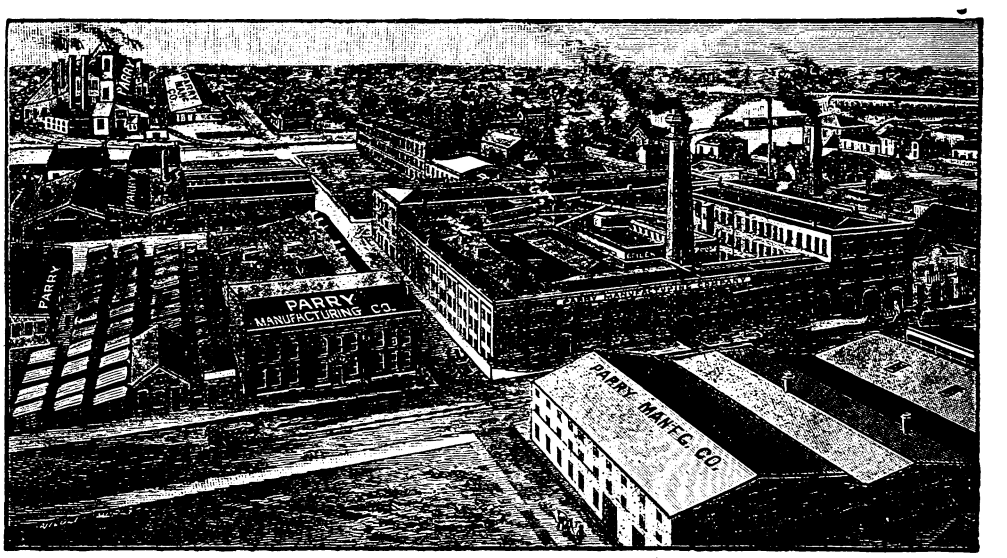
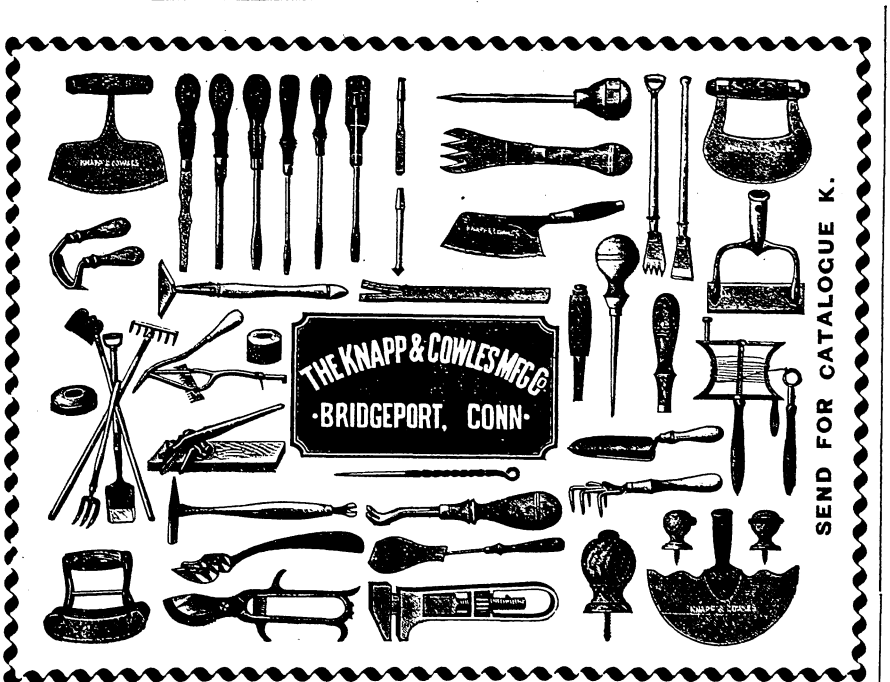
The Largest and Best Equipped Factory on Earth for Producing Superior Vehicles.





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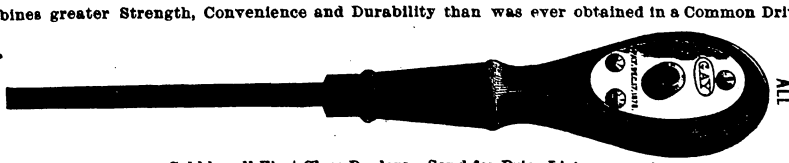
RATCHET SCREW DRIVER

One of the Very Best Tools Ever Invented.

It Combines greater Strength, Convenience and Durability than was ever obtained in a Common Driver

Gives Perfect Satisfaction. Sells Readily



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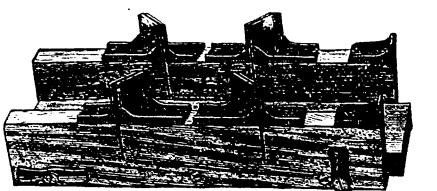
Sold by all First-Class Dealers. Send for Price List.

Manufactured by **CAY & PARSONS** Augusta, Maine, U. S. A

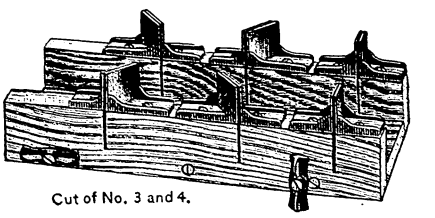
JOHN H. GRAHAM & CO., Agents, 113 Chambers Street New York.

Olmsted's Mitre Boxes



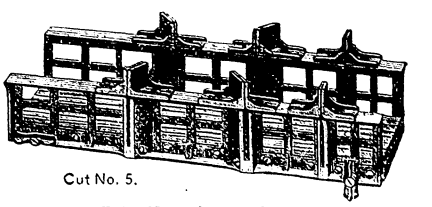
Cut of No. 1 and 2.

Price No. 1, $12; No. 2, $18 per dozen.



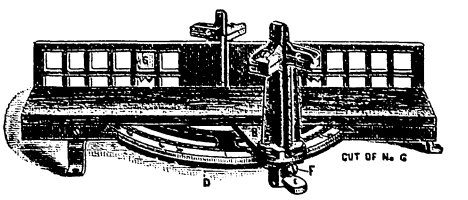
Cut of No. 3 and 4.

Price No. 3, $15; No 4, $21 per dozen.



Cut No. 5.

Price No. 5, $45 per dozen.



Price No. 6, $60 per dozen.

Nos. 1, 2, 3 and 4 have hardwood frames and iron saw guides. No. 5 has iron frame and saw guides. No. 6 is a Universal Mitre Box made of iron and steel. For descriptive circular and discounts address

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GRANTED 1780.

JONATHAN CROOKES & SON,

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Have placed the Agency for the United States for the sale of their celebrated

POCKET KNIVES, RAZORS, Etc.,

——: WITH :——

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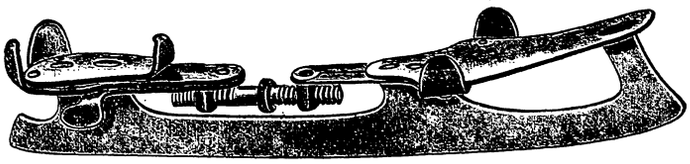
Who intend issuing a new list at reduced prices which will embrace many new styles.

—— ALSO DIRECT IMPORTERS OF ALL KINDS ——

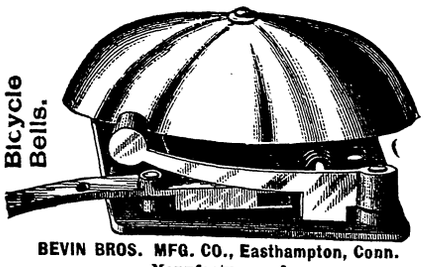
English, German, French and Swedish Cutlery.

The SAMUEL WINSLOW SKATE MFG. CO., Worcester, Mass., U. S. A.



The most extensive Skate Factory in the World.

Bicycle Bells.



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Manufacturers of
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MANUFACTURERS OF
Improved Adjustable Window Screens.
THE QUEEN ANNE. With box panels; the only screen made and finished alike on both sides.
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SCREEN DOORS. Finished all ready to hang. Sticks, Corners, Improved Frames, &c.
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Manufacturers of
Hardware Specialties, Can Openers, Pocket Wrenches, Mincing Knives, Clothes Line Pulleys, &c.
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Harrington & Richardson Arms Company,

MANUFACTURERS OF THE

Improved Automatic Double Action,
3 1-4, 4 & 5 in. Bbls., 32 & 38 Cal.
IMPROVED EJECTING DOUBLE ACTION,
3 1-4 in. Bbls., 32 & 38 Cal.
"Premier" Automatic Double Action Revolvers,
3 1-4, 4 & 5 in. Bbls., 32 & 38 Cal.

This line is unsurpassed for Style, Finish and Convenience in Manipulation.

The Safety Hammer Double Action,—Patented April 5th, 1887,—made in 3 Calibers, 32, 38 and 44. The American Double Action Revolver in 32, 38 and 44 Caliber, with 2¼, 4½ and 6 inch barrels.
The Young America Double Action Line, 22 and 32 Caliber, and The Vest Pocket Self-Cocker, 32 Caliber, Altogether making the most desirable line of Double Action Fire-arms manufactured by any Company in the world.

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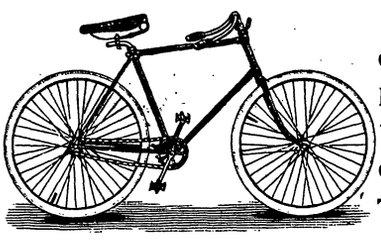
And satisfy your customers.



STRICTLY HIGH GRADE EVERY WHEEL GUARANTEED.

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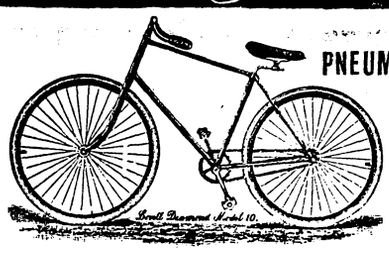

HIGHEST GRADE.
PNEUMATIC, CUSHION AND SOLID TIRES.
FOR LADIES AND GENTLEMEN
MANUFACTURED BY
John P. Lovell Arms Co.
BOSTON, MASS.
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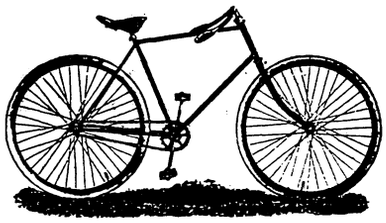
BICYCLE  **MANF'TRS**

From $20 to $135.

MOST COMPLETE LINE MADE.

OFFICE AND FACTORY:
Wells, Schiller and Sigel Sts., and N. Park Ave., Chicago, Ill., U.S.A.

A Wheel

TOLEDO BICYCLE COMPANY, TOLEDO, OHIO.

Properly Designed,
Practically Made,
Combining Strength,
Durability and
Perfect Qualifications.
Such are the

SOLD ON SIGHT.

Dauntless

FALCON JUNIOR, for Boys.
FALCON JUNIOR COMBINATION,
for Boys and Girls.

The only high grade juvenile wheels made. Full ball bearings, perfectly dust proof, 1½ in. pneumatic tire, 24 in. wheels, graceful drop handle bars, combination cork and rubber handles.

The bearings are turned out of solid bar steel, and all material and workmanship are first-class. Made in the same manner, of the same stock, with the same care as the large wheels. Good juvenile wheels are scarce, and ours are going rapidly.

The W. Bingham Company, CLEVELAND, OHIO.

FIG. 3. Showing Davis cork-screw and fulcrum in position to pull cork.

DETROIT CORK-SCREW CO.,

DETROIT, MICH., U. S. A.

Manufacturers of
The Davis Cork-Screw,
The Davis Knife and Cork-Screw,
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Cork Extractors.

Manufacturers of
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Cut Worm Cork-Screws
for the Bar Cork Puller

Send for Price-List and Discounts.

Yacht AND Boat Hardware.

L. W. FERDINAND & CO.,
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Send for 212-Page Catalogue.

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In Your Business or at the Range?

If you deal in ARMS or AMMUNITION or shoot a Rifle, Pistol or Shot Gun, you will make a HIT by sending for the IDEAL HAND BOOK.

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Please mention *The Iron Age* when you write.

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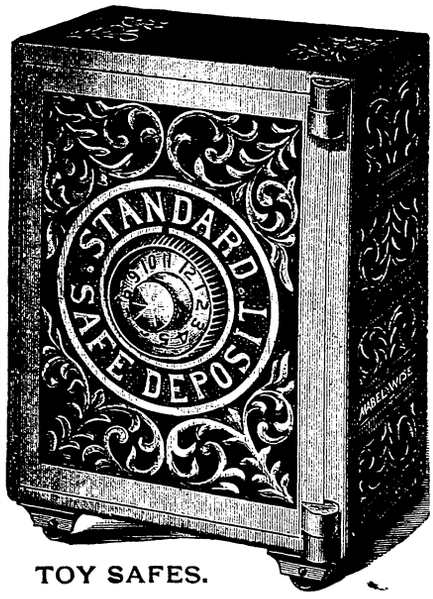
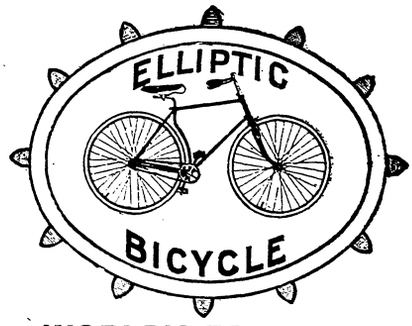


TOY SAFES.



WORLD'S RECORDS.

1-4 Mile,	flying start,	:26 1-5	ONE MILE, 1:56 3-5.
1-4 "	standing start,	:30	
1-2 "	flying start,	:55 1-2	
1-2 "	standing start,	:58 3-5	
1 "	flying start,	1:56 4-5	
1 "	standing start,	2:04 3-5	

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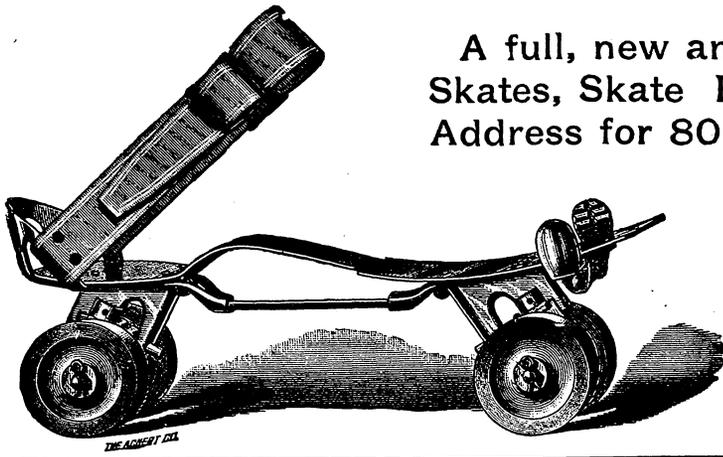

A full, new and complete stock of Roller Skates, Skate Repairs and Rink Supplies. Address for 80 page catalogue and prices,

M. C. Henley,

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Send for the Ohio Lantern Company's list of goods and prices. You *will* be surprised.

Ohio Lantern Co.,

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SURPRISE TUBULAR.

This GUN has rebounding locks and the *barrels can be taken off and put on again without cocking the arm*, and when cocked the hammers may be let down gradually, and without the full force of the blow. It is simple in construction, having very many less pieces than any other hammerless gun.

Easily Tipped and Cocked,
Damascus Barrels,
Handsomely Engraved,
French Walnut Stock.

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New Hammerless Double Gun,

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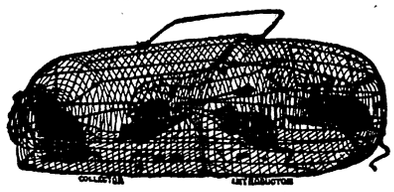
PRICE VERY LOW.

GENUINE **MARTY** RAT AND MOUSE TRAPS

ALWAYS IN STOCK.



THEY DO THE WORK.

Orders solicited. Prices on application.

BURDITT & WILLIAMS,

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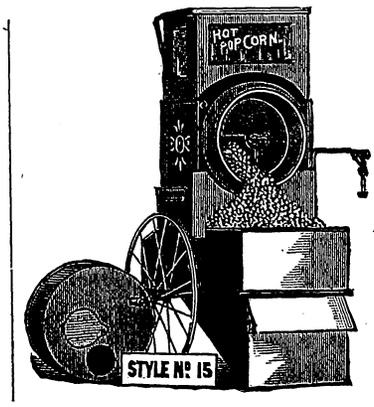

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King of Corn Poppers, Peanut and Coffee Roasters.

The greatest wheel of fortune out, for any person 12 years and upward; $1.00 to $50.00 profit per day; 1500 now in use,

Guaranteed to have no equal. Agents wanted.

Write for illustrated catalogue and prices on Pop Corn, Shelled or on Cob, Balls, Bricks and other supplies.

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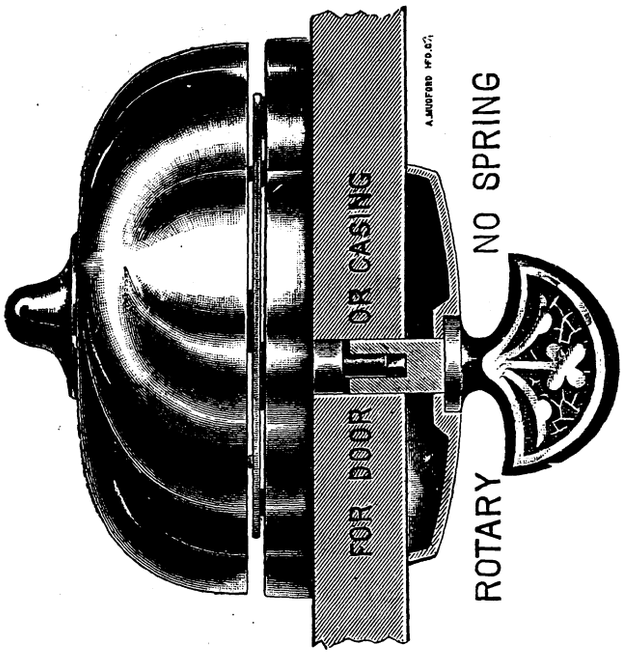
ELECTRICAL RESULTS.

(PATENTED JULY 14, 1891; MARCH 29, 1892.)



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Simply turning the knob about ONE-FOURTH IN EITHER DIRECTION produces about TEN CLEAR, FULL tones, which, though not startling or annoying, can be better heard all through the house than any bell ever made to imitate Electrical Results.

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No. 91, - - - - - - Nickel Plated.
No. 92, - - - - - - - Bronze Plated.
PER DOZEN, $20.00

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LIBERAL DISCOUNT TO THE TRADE.

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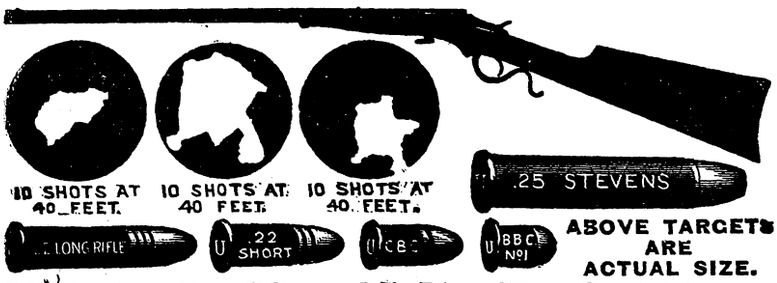
GENERAL AGENTS.

A Triumph in Small Bore Rifles.

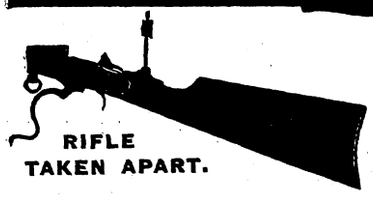
STEVENS' "FAVORITE" RIFLE.



ABOVE TARGETS ARE ACTUAL SIZE.

Made for the 22 or 25 Rim Fire Cartridge.

WEIGHT, 4½ POUNDS.
22-INCH BARREL.
LEVER ACTION LIKE SHARPS.
TAKEN APART IN TEN SECONDS.
IT IS SIMPLY IMPOSSIBLE TO MAKE MORE ACCURATE SHOOTING BARRELS THAN ARE ON THIS RIFLE.



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No. 18. Vernier, Open Back, and Beach Front Sights..... 17.00
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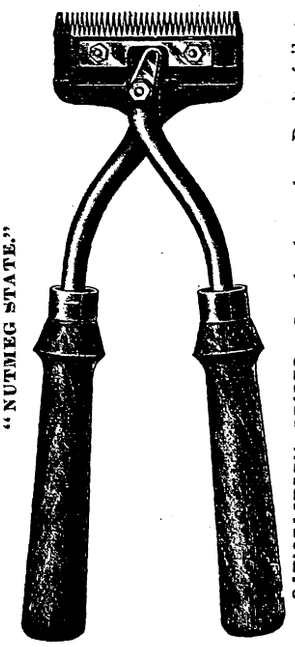
MANUFACTURER OF HARDWARE,
BRIDGEPORT, CONN.



"NUTMEG STATE."

SATISFACTORY PRICES. Standard goods. Don't fail to write when in want of Horse and Barber's Clippers, No. 20 Steel Rat Killers, Curry Combs, Metal and Wood Choker Mouse Traps Lemon Squeezers, Baxter Pattern Wrenches, &c., &c.

AMERICAN TOOL COMPANY,
NEW YORK,
MANUFACTURERS OF

TOOL CHESTS

Of all sizes, complete with tools, for Hardware, Toy Notion and Variety trades.
Factory and Salesroom,
200 West Houston Street, near Varick.
Also Machinists' Tool Chests, empty. Illustrated Catalogue and prices furnished on application.

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"NEVER-BREAK"

Wrought Steel Spiders

Wrought Steel Griddles, Kettles, Stew Pans, Stew Pots, Mashins, Scotch Bowls, Hotel Sauce Pans, &c.

MIRROR POLISHED—TINNED—PORCELAINED.

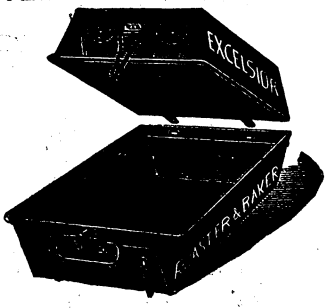
"PURITAN"

COOKERS, COFFEE POTS AND OTHER SPECIALTIES.

Cooks Quicker than any other Porcelain Rice Boiler made.

"EXCELSIOR"

Roasting and Baking Pan.
PLANISHED and PLAIN STEEL.



"MIRROR POLISH," the only Perfect Plain Steel Finish

SOLE MANUFACTURERS

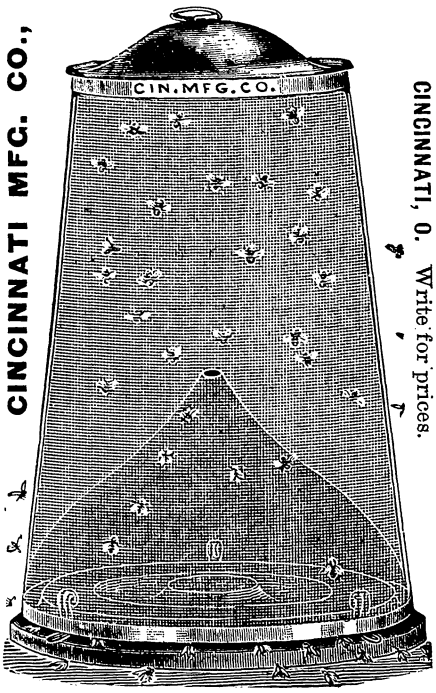
THE BRONSON SUPPLY COMPANY,

CLEVELAND AND NEW YORK.

LEADER FLY TRAPS.

Corn Poppers and other Wire Goods.
Manufactured by

CINCINNATI MFG. CO.,



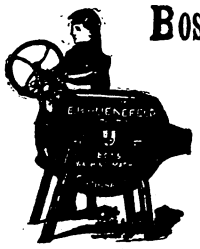
CINCINNATI, O. Write for prices.

SHEETS,
COOKING UTENSILS,
MEDALS,

Sheets and Rivets for Boats and Coffins.

Bars for Horse Shoes.

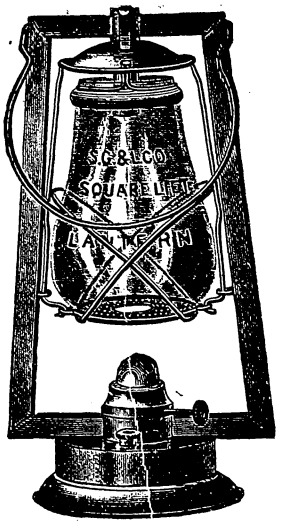
ILLINOIS PURE ALUMINUM CO.,
LEMONT, ILLINOIS.



Boss Washing Mch.

An Entirely New Invention. Double acting, working with two cylinders in opposite directions. The greatest saver of household labor ever invented.

E. H. HUENEFELD,
CINCINNATI, O.
Send for Circular



Square Lift Wire Lantern. Open.

Steam Gauge AND Lantern Co.

Syracuse, N. Y.

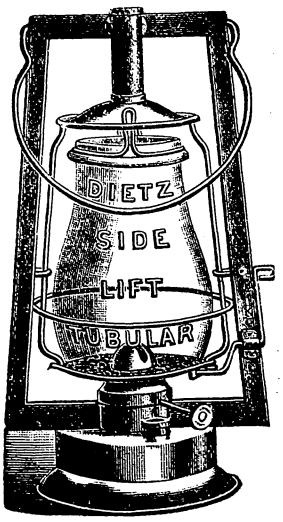
Western Branch: 25 Lake St., Chicago, Ill.

—MANUFACTURERS OF—

Standard Tubular Lamps and Lanterns.

THE BEST IN THE WORLD,

Tubular Lanterns,
Tubular Street Lamps,
Tubular Hanging Lamps,
Tubular Station Lamps,
Tubular Driving Lamps. etc.



ESTABLISHED 1840.

A WORD TO THE WISE.

When you purchase a Lantern, Street Lamp or Driving Lamp, remember the

"DIETZ" Make

is the best. Our goods have stood the test of time and are safe and reliable. The name "**DIETZ**" is plainly stamped on them. Our specialty is **Tubular Lanterns, Street Lamps and Driving Lamps.** We make a large variety, being the oldest and largest house in our line.

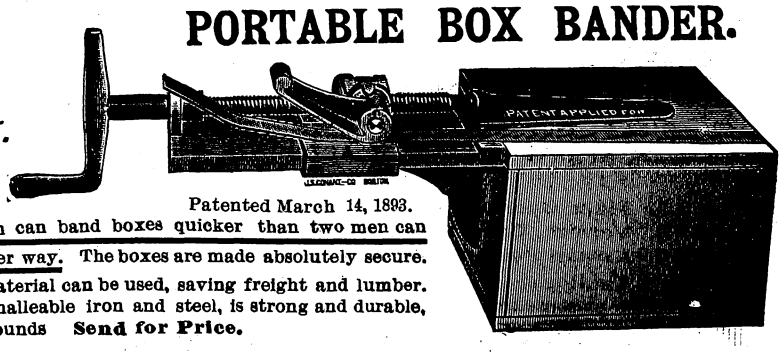
ASK FOR THEM!

R. E. DIETZ COMPANY,

New York, 60 Laight St. U. S. A. Chicago, 25 Lake St.

SOON PAYS FOR ITSELF.

PORTABLE BOX BANDER.



Patented March 14, 1893.

One man can band boxes quicker than two men can in any other way. The boxes are made absolutely secure. Lighter material can be used, saving freight and lumber. Made of malleable iron and steel, is strong and durable, weighs 8 pounds **Send for Price.**

J. W. GOODELL, Manufacturer, - - BURLINGTON, VT.

Hosted by Google

ENTERPRISE LAWN SPRINKLER.

No. 1, $3.50; No. 2, $2.75.

Indispensable to a well kept Lawn.

.....

A Sprinkler which will work satisfactorily in spite of muddy water.

.....

May be easily moved from place to place without going near it

.....

SOLD BY ALL HARDWARE DEALERS.

.....

SEND FOR CATALOGUE.

ADVANTAGES:

1st. Each machine is furnished with a cord or rope, so that the sprinkler may be easily moved, when running, without going near it.

2d. The water passes through a strainer before it enters the small perforations, which are thereby prevented from filling up.

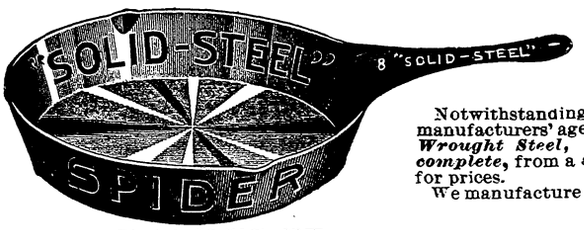
3d. It is so constructed that the weight of its revolving parts is removed by the pressure of the water, thus overcoming unnecessary wear.

4th. All parts of the machine are made sufficiently strong for ordinarily rough usage and are interchangeable.

5th. The machine is TINNED and NICKEL PLATED and is of very handsome appearance.

THE ENTERPRISE MFG. CO., of PA., 3d and Dauphin Sts., Philadelphia. Branch Office, with J. C. McCarty & Co., 97 Chambers Street, N. Y.

"SOLID-STEEL" SEAMLESS HOLLOW WARE.

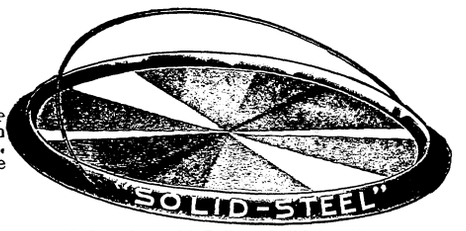


No Seams, no Rivets in "Solid-Steel" Ware.

BRILLIANT FINISH.

Notwithstanding the claims made by some manufacturers' agents, *our* spiders are made from *Wrought Steel, Without Seams or Rivets, complete*, from a *single piece of metal.* Write for prices.

We manufacture our own goods.



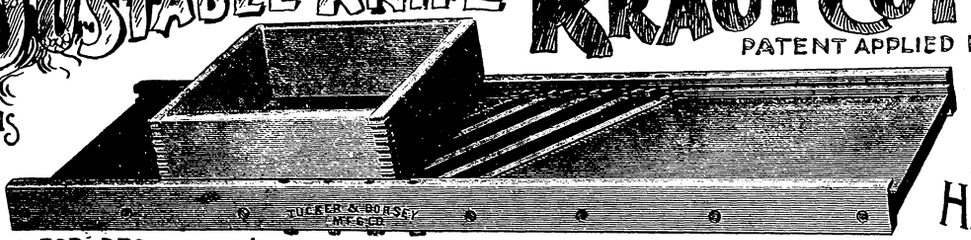
Made either with Balls or Solid Handles.

The Cleveland Stamping & Tool Co., Cleveland, O.

☞ We are in shape to figure on light and heavy stamping, and in addition to the above we build Dies and Stamping Machinery.

ADJUSTABLE KNIFE KRAUT CUTTER.

PATENT APPLIED FOR.

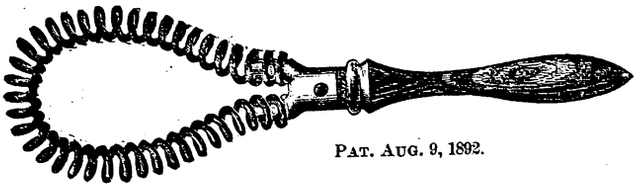


DIRECTIONS
LOOSEN BOLTS.
SET KNIVES FOR DESIRED CUT.
TIGHTEN BOLTS

PERFECT.
SIMPLE.
HANDSOME.

TUCKER & DORSEY MFG. CO. INDIANAPOLIS, IND.

THE BOSS DUST BEATER.



PAT. AUG. 9, 1892.

NEAT, DURABLE, AND DOES THE BUSINESS.

For removing dust and filth from Clothing, Upholstered Furniture, Rugs and Carpets it is just the thing. Will raise the nap and so improve the appearance. Will not, like other Dust Beaters, leave marks, nor tear the fabric. The coil is of steel wire secured in a malleable iron socket and attached to an enameled wooden handle. Just what everybody wants.

Retail Price, 25 Cents. Sent by Mail, 35 Cents.

PEABODY & PARKS,

Manufacturers, TROY, N. Y.

JACKETED KETTLES.
HOLLOWARE.

THE STUART & PETERSON CO.,
Philadelphia, Pa., and Burlington, N. J.

American Stamping Co.,

Manufacturers of

All Kinds of Tinware and Sheet Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.
Factory, 103 to 119 N. 3d St., Brooklyn, E. D., N. Y.

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DULL TIMES

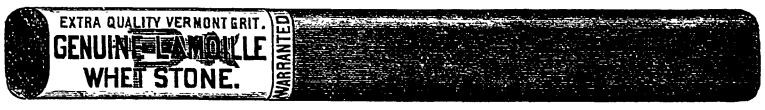
Are discouraging. So also are

Dull Tools.

A well assorted stock of

PIKE'S WHETSTONES

will insure sharp tools and better business.



Now is the time to examine your stock and determine your wants for another season. Our scythe stones have outsold all others this season twice over.

Leading Tool Dealers claim they have at last found an **Oil Stone** that they can safely **guarantee** in

Pike's Lily White Washita.

Good mechanics will have no other. It pays to handle the best. *Inferior goods are dear at any price.*

THE PIKE MFG. CO.,

PIKE STATION, N. H.

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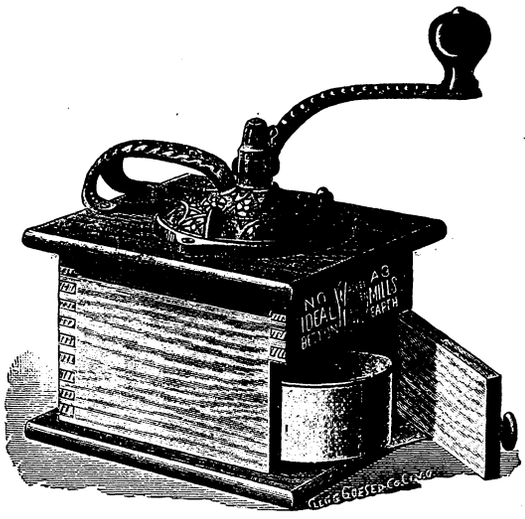
"BIG W. W. W. W. FOUR."



A certain company are claiming to be "sole manufacturers of Waddel's Coffee Mills," ("If you see it in the sun its so"). The statement is designed to mislead the trade. The old line of Waddel's Coffee Mills, which have been on the market the past five years, are not manufactured by *us*. We are making a new line of Coffee Mills which are guaranteed to grind twice as fast as similar goods, and each mill is labeled under a trade-mark "Ideal Coffee Mills manufactured by Waddel Woodenware Works; best on earth." Specify the new goods and order "Ideal Mills," and our word for it, you will not make a mistake. Address plainly

Waddel Wooden Ware Works or "4 W.,"

Greenfield, Ohio.

MANUFACTURERS OF

CASH REGISTERS, MONEY DRAWERS, COFFEE MILLS, RAT TRAPS and NOVELTIES.

PROFIT MAKING

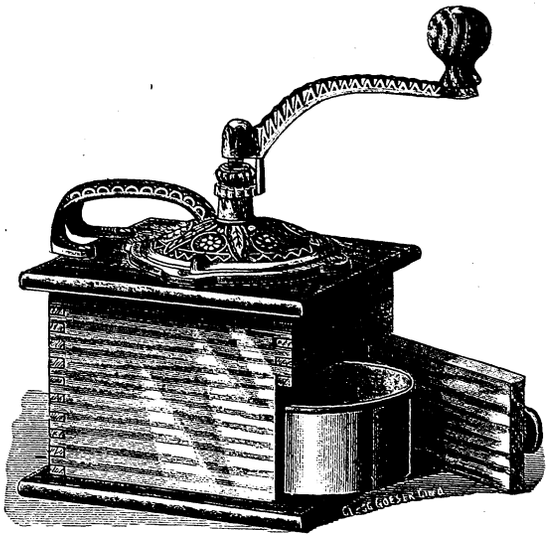
articles. Something every dealer is looking for. The Anthony Wayne Washer is one. You can readily prove this by ordering a sample machine. You won't have to sell it—it sells itself.

THE ANTHONY WAYNE MFG. CO., - Ft. Wayne, Ind.

The Sun Manufacturing Co.,

Successors to the Jno. M. Waddel Mfg. Co.,

ARE SOLE OWNERS AND MANUFACTURERS OF



Waddel's Improved Coffee Mills,

Cathedral Gong Money Drawer and Surprise Rat Traps.

Beware of Infringements.—We will protect our Patents.

"THE 'SUN' ONLY, SHINES FOR ALL."

A New Name, A New Reputation,

A New Line of Coffee Mills

That under the SUN Brand shine as leaders.

RAPID GRINDERS that will STAND THE WEAR.

STEEL ALLOY BUHRS,

A metal of recent discovery for this purpose used solely and only by the SUN. Warranted to outwear, outgrind and outsell any Coffee Mill ever put on the market.

We Challenge a Competing Test for Rapid Grinding and Wearing Surface.

Our New Line bears the **Sun Trade Mark** and is labeled **Steel Alloy Buhrs.**

Write for Our Cata ogue and New Prices.

Order a Sample Mill.

THE SUN MANUFACTURING CO.,

Greenfield, - Ohio, U. S. A.,

MANUFACTURERS OF

Cash Registers, Money Drawers, Coffee Mills and Wooden Ware Sp cialties.

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The Utility

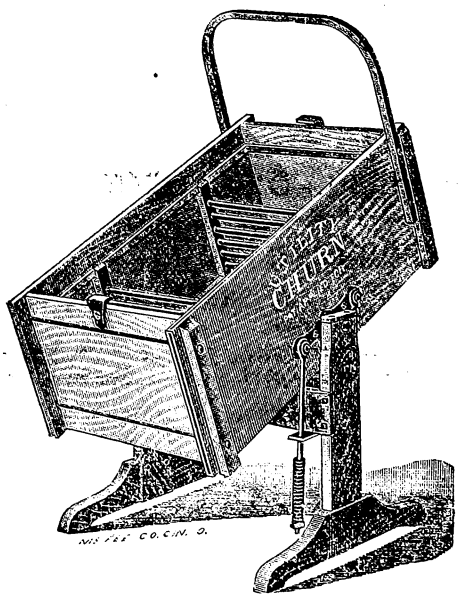
of an invention

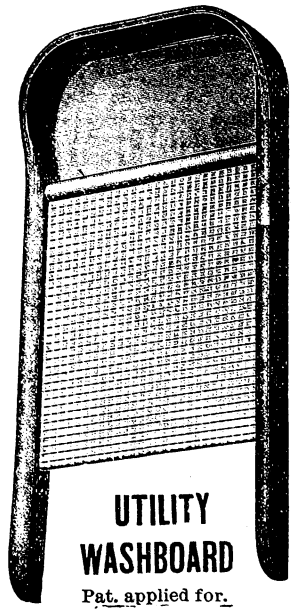
Is its Usefulness

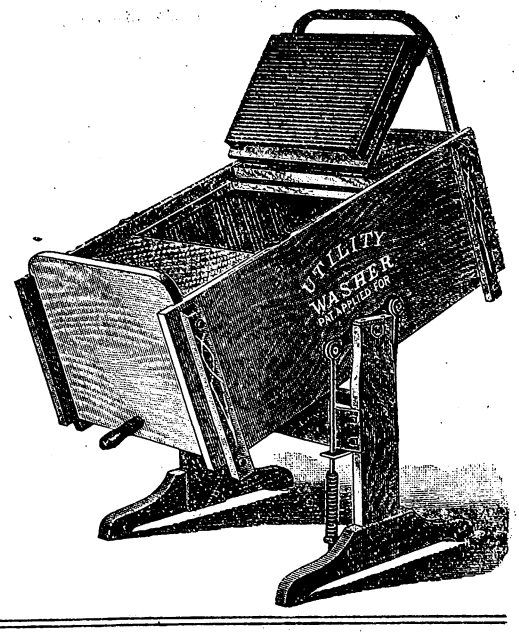
The "Utility" Washer, "Utility" Churn and "Utility" Washboard exemplify this in the highest degree. They are each the best of their kind and really recommend themselves Write for printed matter and prices.

The Olds Wagon Works,

Fort Wayne, Ind.







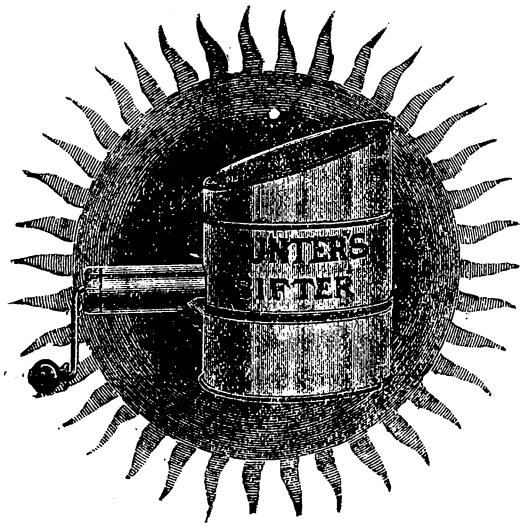
Say! As a Dealer

Have'nt you handled a variety of washing machines; some poor, some not much better and some of the best? And now you're looking for perfection. This is found only in

NEFF'S

Order one and see for yourself if it's not so.

W. H. NEFF, - - COWAN, IND.



Imitations

of the famous Hunter's Sifters are now plentiful, the fact, nevertheless, is that there's but one genuine Hunter Sifter, that's the one we are making and which we ask you to buy.

—ADDRESS—

The FRED J. MEYERS MFG. CO.,

COVINGTON, KY

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Just Published.—THIRD REVISED EDITION.

THE IRON AGE STANDARD HARDWARE LISTS

FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

The success of the effort to give the lists in small space is illustrated in many of the lists, in which a clear and condensed arrangement is secured. For instance, the wrench list occupies but 3 inches by ¼ inch, while the list of Stove Hollow Ware, in very small space, gives the list prices on a large and important line of goods which often occupy several pages in catalogues. In several lists, such as Strap and T Hinges and Butts, a new arrangement is adopted, which is regarded as presenting these lists in a very convenient as well as condensed form.

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3½ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out and inserted in price books, and *can be used in connection with any of The Iron Age Hardware Price Books.*

That the Standard Hardware Price Lists meet a want of the trade is evident from the fact that a Third edition is already called for.

Saucepans and Round Boilers.

	Plain	Turned.	Tin'd or End.
Pints.			
1	$0.30	.35	.39
1½	.32	.37	.44
2	.35	.39	.48
3	.42	.47	.56
Quarts.			
2	.50	.56	.63
2½	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
Gallons.			
2	.85	.96	1.31
2½	1.05	1.18	1.56
3	1.20	1.35	1.70

Stove Hollow Ware. Ground and Unground.

POTS, KETTLES, ETC. (CAST IRON.)

No.....	6	7	8	9	10	11
Pots.....	$0.65	.75	.85	1.00	1.25	1.75
Kettles.....	.55	.65	.70	.85	1.00	1.40
T Kettles.....	.75	.80	.90	1.00	1.25	....
Spiders.....	.27	.30	.35	.40	.50	.60
Griddles Round	.22	.25	.27	.30	....	....
" Long..	.40	.50	.60	.75	....	....

SCOTCH AND YANKEE BOWLS.

No ...	1	2	3	4	5	6
Scotch Bowls..	$0.35	.40	.45	.50	.60	.70
Yankee Bowls.	.35	.45	.55	.65	.75	.90

Wrenches. Standard List.

Inches.	6	8	10	12	15	18	21
Black...	$9.00	$10.00	$12.00	$14.00	$24.00	$30.00	$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

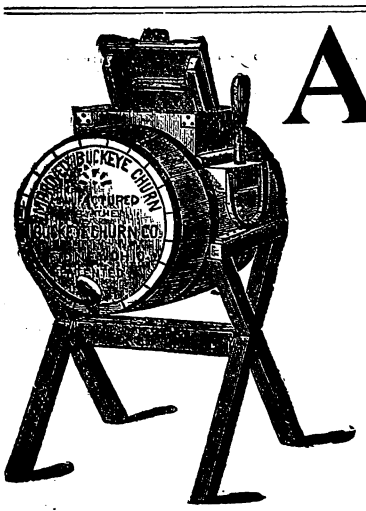
Glue Pots. Tinned or Enameled

No. 4/0....	$4.50	No. 2	$8.40
3/0....	5.00	3	10.26
2/0....	5.50	4	12.42
0	6.00	5	14.58
1	6.75	6.	16.94

EVERY HARDWAREMAN SHOULD HAVE A COPY. Price 25 cts.

Sent, postpaid, on receipt of Price, by

DAVID WILLIAMS, Publisher and Bookseller, 96-102 Reade Street, N. Y.



A Buckeye

Churn is the best for making butter quick, cleanly and rapidly. There are others, but none its equal. A child delights in operating it. Order a sample. See if it doesn't sell quick. Our Queen Washing Machine is another excellent household adjunct, cheap but good. Agencies given. Write

BUCKEYE CHURN COMPANY,

SIDNEY, OHIO.

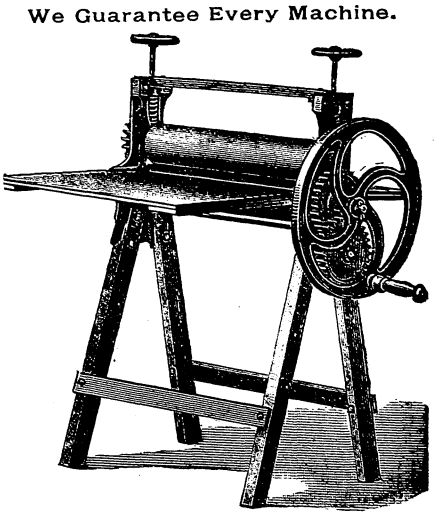
The Family Mangle.

WARRANTED TO DO

Better Work than Hand-work.

SAVES all the fuel. two-thirds the work. Keeps the linen whiter.

We Guarantee Every Machine.



Send for descriptive circular to

S. C. Johnson, Racine, Wis.

Agents Wanted.

The "CLIMAX."

Widest

washing machine made, especially adapted to washing grain sacks, carpets and bedding. The bottom slats are adjustable. The rubber is out of the way when handling the clothes. The bottom is of galvanized iron No. 27. And, above all, please recollect this is no

EXPERIMENT.

Write for Prices and Discounts.

—THE—

STEARNS MFG. CO.,

CONNERSVILLE, IND.,

Manufacturers of

CLIMAX WASHER, CLIMAX WOOD and CHAIN PUMPS, ETC.

THE

"AUBURN"

ICE TONGS.

For Quality of Workmanship and Price the "Auburn" excels all other tongs on the market.

SEND A TRIAL ORDER AND BE CONVINCED.

ROBERT STOPPARD,

Sole Manufacturer, AUBURN, N. Y.

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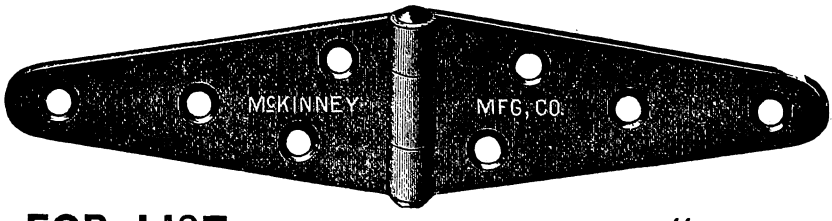
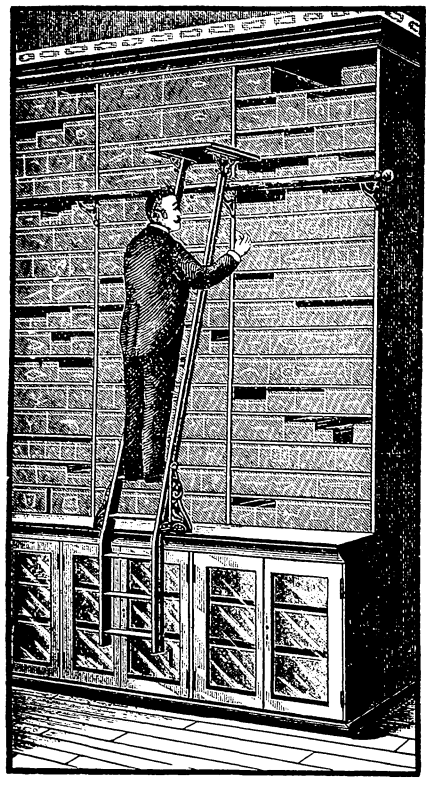
WE CLAIM

That one pair of our Celebrated Steel Hinges will outwear two pair of the Flimsy Invention now being forced upon the attention of the trade.

McKINNEY MFG. CO., ALLEGHENY, PA.

Steel  Hinges.

SEND FOR LIST. **"NONE BETTER."**



THE BICYCLE STEP LADDER

The Newest, Neatest, Simplest, Easiest Opera d and Safest Store Ladder made.

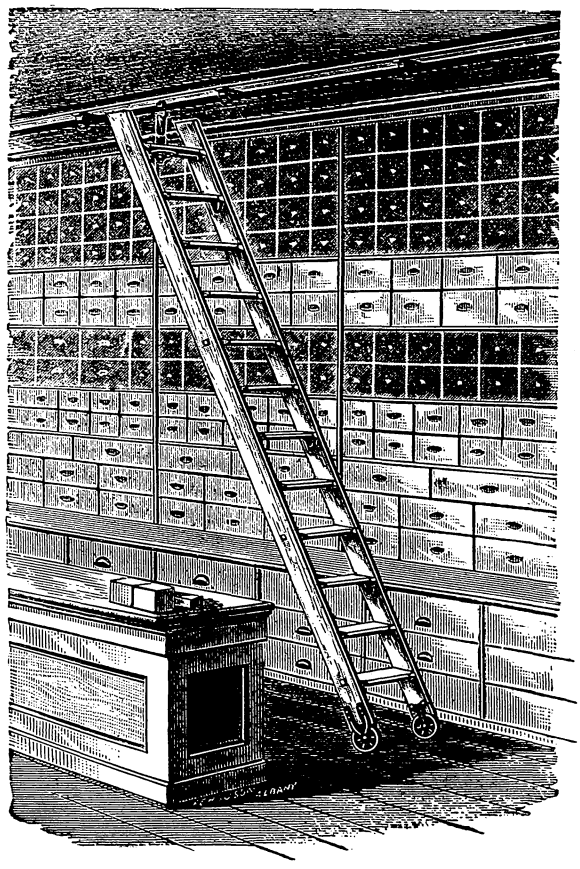
Ladders are not *Suspended*, but *Supported* from below on wheels. Move easier with operator on than others when empty. Highly finished, and very handsome. Made in different grades and prices to suit.

Send for illustrated catalogue and prices.

See this space next week for other styles.

The Bicycle Step Ladder Co., 50 State Street, Chicago, Ills.

THE "NOISELESS" STORE LADDER.



The latest and best. Perfectly noiseless. Neat in appearance.

Manufactured by

M. CROISANT,

ALBANY, N. Y.

N. Y. Office, 103 Chambers St., W. H. QUINN, Manager

Pocket Companion. Containing useful information and tables appertaining to the use of wrought iron and steel as manufactured by Carnegie, Phipps & Co., Ltd., Pittsburgh, Pa. For engineers, architects and builders. 1892 edition. Edited by C. L. STROBEL, C.E., assisted by F. H. KINDL, C.E. Leather with flap, 334 pages..... $2.00

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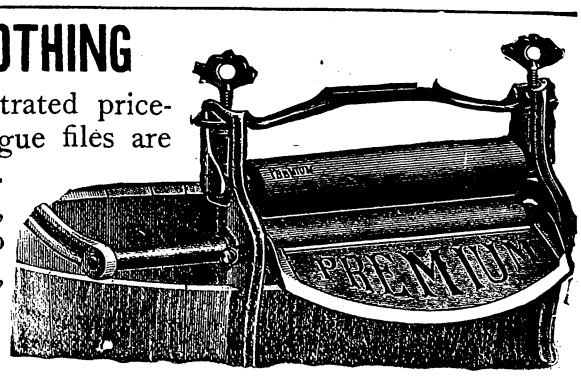

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THE CLARK MFG. CO.,

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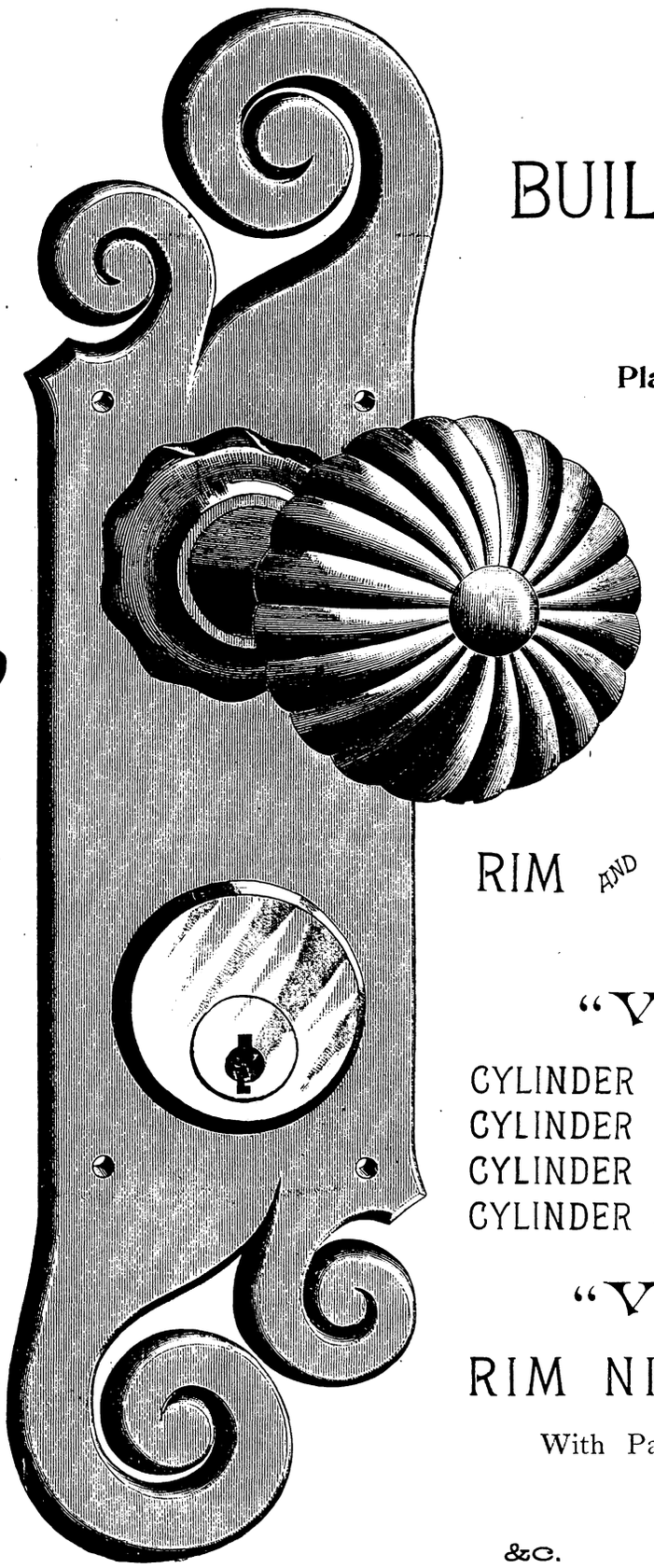

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RIM NIGHT LATCHES,

With Patent Self-Adjusting Connecting Spindle,

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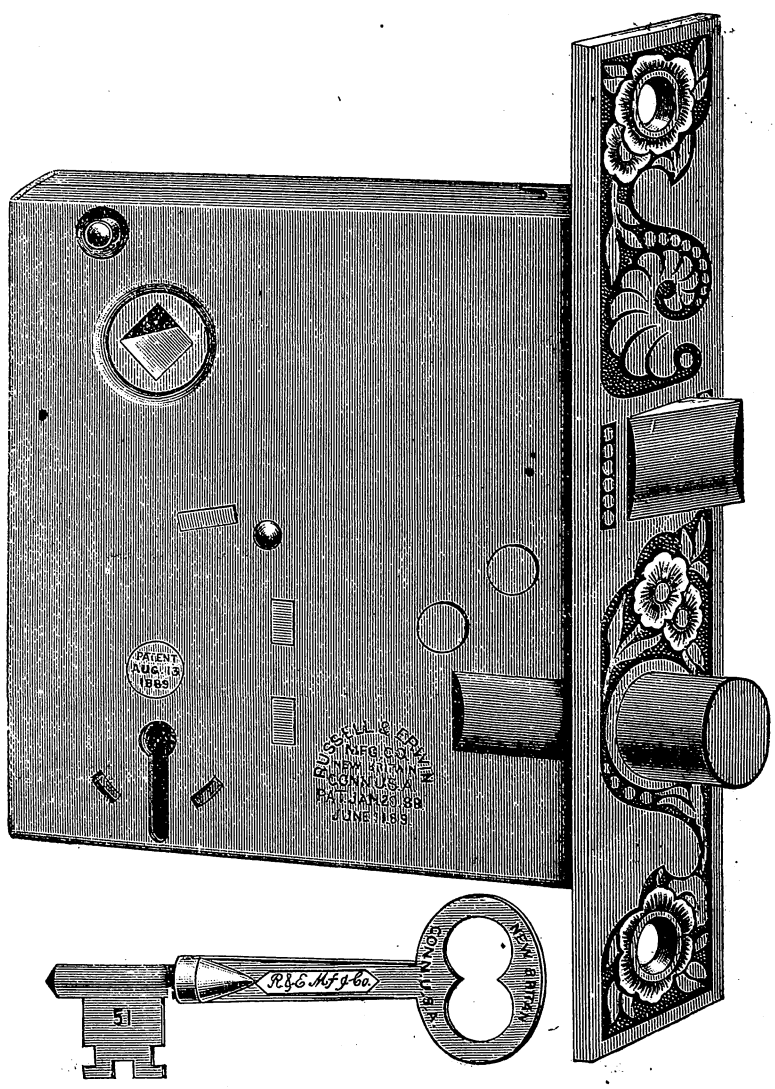
They Excel in Finish,



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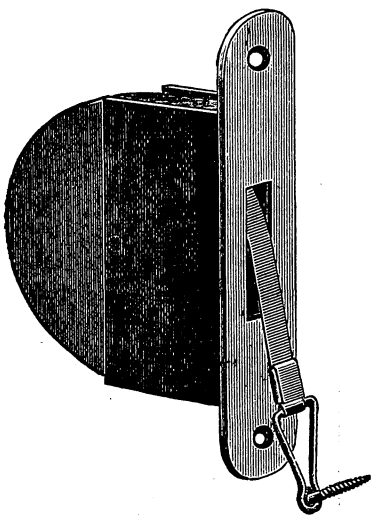
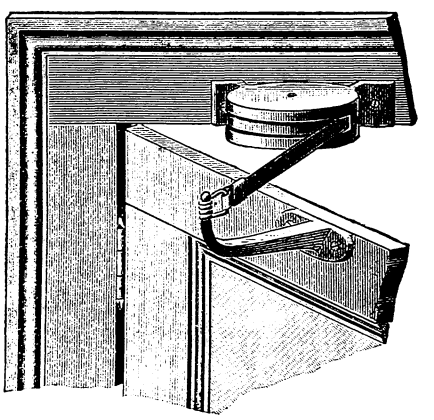


The obvious superiority of our Steel Frame Sash Balance is being very rapidly developed. **Architects** and **property owners** find their application not only very simple, but much more durable than cotton cord and cumbersome cast iron weights; and when box frames are considered as part of the cost when weights and cord are used, makes our device lower in price. The frame being **steel** and suspending band **aluminum,** makes them indestructible. They are the most proper appliance ever invented to counterbalance the weight of a sash. Without pocket or box frames. Occupying the space of an ordinary axle pulley. Made in several styles, for all classes of windows, show cases, wall cases, &c. Our Door Spring is one of the best on the market for screen doors.



DOOR SPRING.

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Please don't confuse our Balance with inferior makes.

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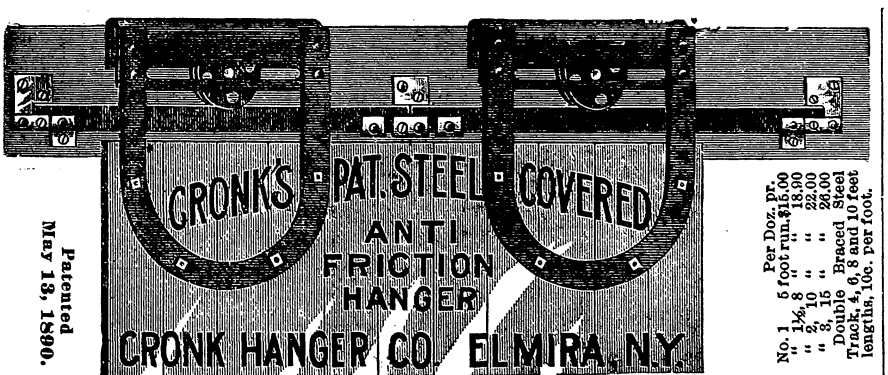
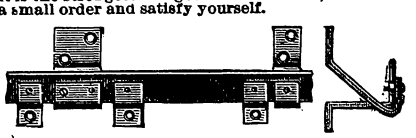
New York Office: 142 Chambers St., - ROBLEY & BRUNDAGE.



We are the original makers of steel covered hangers and all others are imitations. Beware of infringements, as we shall protect our rights.

In our Steel Covered Hangers we have all the desirable features of the Best Hangers in the market, and with that we combine the cover for wheels SO NO ICE OR SNOW can reach the wheels, and making this cover as we do, we stiffen it so it is the strongest Hanger in the market, and we believe it is just perfect. Would be glad to have you try a small order and satisfy yourself.

Double-Braced  Steel Rail.

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This rail being double-braced and double-riveted is the strongest rail in the market. Being braced both ways it will not sag. The joint is made so it is perfectly solid. It comes complete and ready for use, requiring only screws and screw driver for any man or boy to put it up in short order. It can be used for any grooved wheel Hanger, and a heavy door will not make it spring or tremble. Guaranteed to hold a door weighing 2,000 pounds, and used in connection with our Anti-Friction Hanger will work perfectly on large or small doors.

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Made of wrought steel strap; cast block with slot adjusted by loosening bolt.

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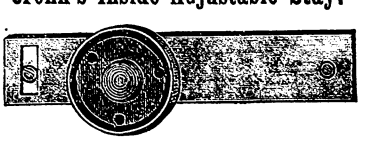

Is cheap, simple and durable, and much better than a cleat nailed on the floor for this avoids all friction and leaves no place for dirt to accumulate. $2.00 per doz. No inside door can be properly hung without this stay.

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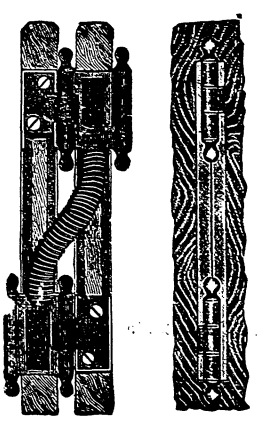
Chicago Spring Butts.



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DOORS.	1 Jap'ed Pair.	21 Nickel Plated Pair.	31 Bronze Plated Pair.	41 Real Bronze Pair.	51 Polished Brass, Pair.
⅞ to 1 in.	$1.20	$3.00	$3.00	$7.25	$7.25
1⅛ to 1¼ in.	1.50	3.75	3.75	8.00	8.00
1⅜ to 1½ in.	2.50	5.50	5.50	10.75	10.75
1¾ to 2 in.	4.00	7.50	7.50	18.00	18.00
2¼ to 2½ in.	7.00	10.00	10.00	27.00	27.00
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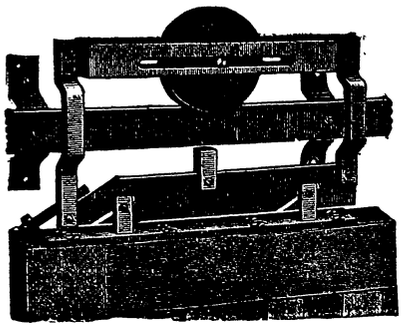

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PARLOR DOOR HANGER.

This Hanger is made of Steel.
The Wheel is also Steel, except the filling or tread.
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The Hanger is Anti-Friction.
More nearly Noiseless than any other.
Ease of adjustment.

Can be erected with half the labor others require.
Track will not swell, shrink or warp out of true.
No cutting of doors.
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Simplicity in all its parts.
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ALSO LANE BARN DOOR HANGER AND TRACK. SEND FOR CIRCULARS.

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"He had also in his possession 55 skeleton keys which the police claim would open any door."—Chicago Tribune. **You are selling** that kind of a lock to your customers every day. **Sell** a lock that has a guarantee against Sneak Thieves. It don't cost you any more and is sure to give you customers more confidence in you and your goods. THE CRAIG LOCK CANNOT BE PICKED. That's our guarantee.

KEYLESS LOCK CO.,

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KEYSTONE LOCK WORKS,

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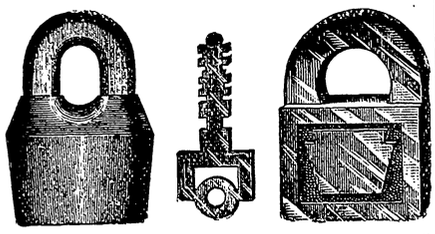

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Eight Tumblers. Key Turning Both Ways.

Sizes; ¾ inch to 2½ inches; of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also, ½ and ⅝ inch Padlocks, opened with a common pin, in brass and nickel; for cats and small dogs. The best Railroad Switch and Car Lock in the world. Adopted by the United States Treasury for bonded warehouses.

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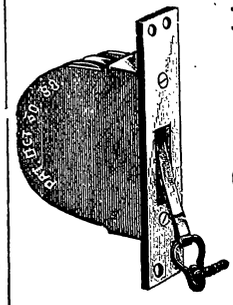

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CAN RECOMMEND THE

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to their customers as a reliable substitute for Sash Cords, very strong and lasting (some in daily use ten years), and gives thorough satisfaction wherever used. The patented attachments are very simple and can be applied to any window.

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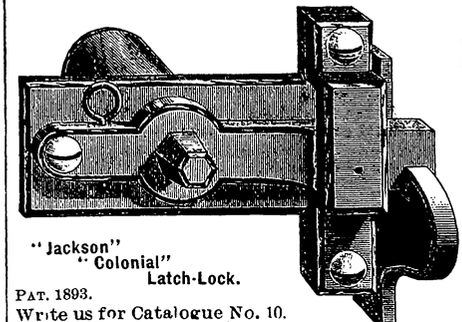

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Latch-Lock.

PAT. 1893.

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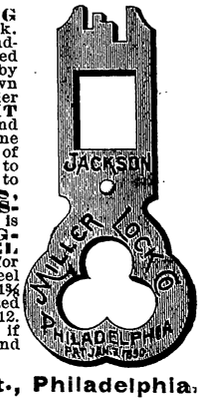
Order samples of your Jobber.

THE LATCH STRING replaced by a Lock. The Latch remains of handsome **BRONZE.** Operated by **KEY** from outside, by **LIFT** from inside. Thrown **"OFF"** by the **PIN** under the Latch. Made **RIGHT** and **LEFT HAND**, and readily adjustable from one hand to the other. Length of Latch 4 inches. Adapted to all doors that open inward; to **GATES, GRILLES, ETC.** When made in **MASTER KEYED SETS** is the cheapest fine **BURGLAR-PROOF HOTEL LOCK** extant. No. 75⅞ for ⅞ inch wood, 3 plated steel keys, per doz. $12. No. 75 1⅜ for 1⅜ inch wood, three plated steel keys, per doz. $12. **BRONZE** Escutcheon, if used, permits ⅛ inch adjustment as to wood, costs extra $1.50 per dozen, and makes same trim as used on more costly lock.



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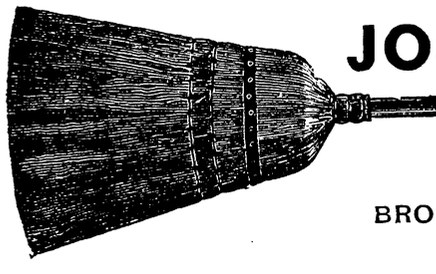

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MANUFACTURERS OF

BROOMS AND BRUSHES OF ALL KINDS.

Those of the Heavier Work a Specialty.

FOR RAILROAD, SHOP, WAREHOUSE, STREET, STABLE, BLOOM, CHILL, CASTING and MOULDERS' BRUSHES, &c., &c.

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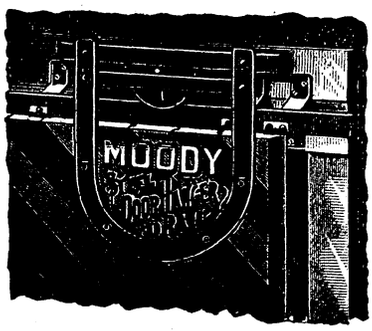
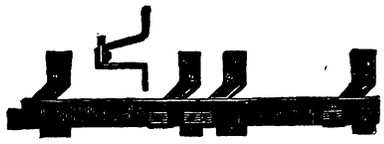


Showing one-half set of hangers attached to door.

STEEL RAIL.



The Only Bracing Bracket Made.

PRICE-LIST.

HANGERS.	Per Doz. prs.
No. 5, to run 6 feet, 3½ in. wheel,	$10.00
No. 6, to run 10 feet, 4½ in. wheel,	15.00
No. 7, to run 15 feet, 5½ in. wheel,	22.00
RAIL, per foot	6½ cents

SOLID BRAIDED SASH CORDS, &c.

Picture Wire, Bright Wire Goods, Picture Nails,
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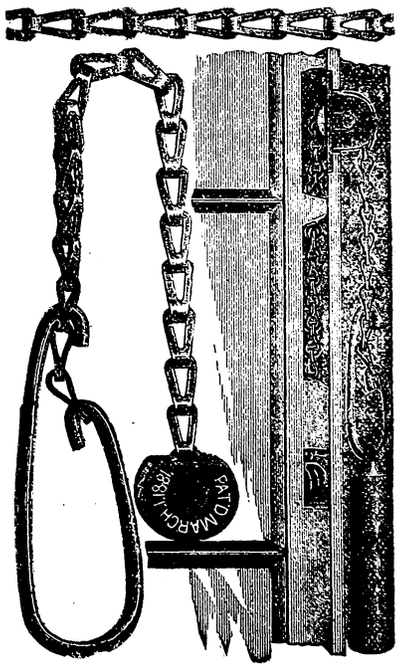

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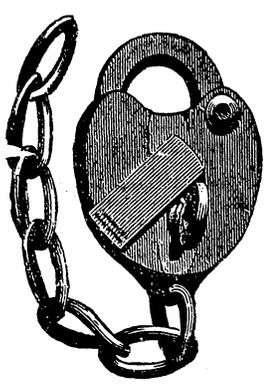
Centennial Award. "Superior in Every Respect"

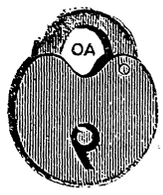
This is one of the best selling locks in the market, and affords the dealer a large profit. It is thoroughly and strongly made—of the best material—very handsome in appearance, and every Lock is warranted. Orders solicited.

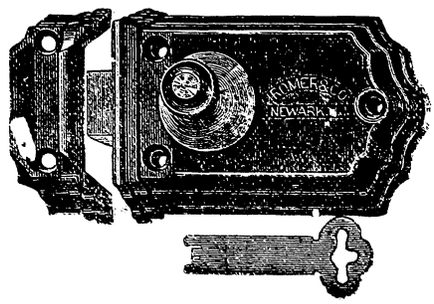
THE GIANT METAL SASH CHAIN

is a substitute for cord in hanging weights to windows. It is manufactured by us only, and by automatic machinery, patented and owned exclusively by ourselves, and whereby we secure uniformity of construction and quality. We have been to great expense in producing a metal having all the qualities and conditions requisite for making suitable chain for this purpose, and to prevent other chain of the same pattern of link and of the same general appearance, but made from an inferior metal, being offered as the same thing, we patented the word "Giant" as a Trade-Mark, as applied to either metal or chain. Trade-Mark Registered April 16, 1878, and October 22, 1878, and our metal is therefore known in the market as "Giant Metal," and our chain as "Giant Metal Sash Chain."

ROMER & COMPANY, Manufacturers of PATENT JAIL LOCKS, BRASS and IRON PADLOCKS,







Adjustable Door Knobs and Trimmings,
Front Door Handles.

Patent Horizontal Rim Cylinder Reversible Night Latches.

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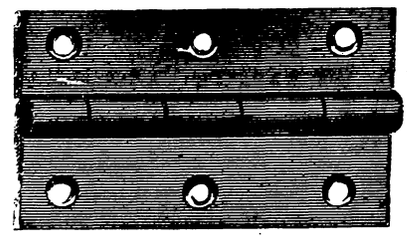

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IN STOCK AND FOR SALE BY

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Nos. 16 & 18 Chambers Street, New York.

MANUFACTURERS OF

BRASS, GALVANIZED & SHIP CHANDLERY HARDWARE.

SIMPLEST IN CONSTRUCTION.
EASIEST FITTED.

Cheapest and Best Balance Made.

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General Agents, Harmon & Dixon, 118 Chambers St., New York.

COMMON SENSE SASH BALANCE.

The **Best** and most **Practical** substitute for weights invented. The most **Durable**, the **Cheapest** and best device for all **ordinary windows.** Balances when in position are out of sight. No rivets, bolts or screws are used in putting it together, so that nothing can get out of order or need repairing. No cutting, boring or marring the sash, as the Balances are let into the jamb.

Manufacturers of Sash Balances, Sash Locks, Sash Lifts, Monitor Sad Irons.

STEWART & BAKER,
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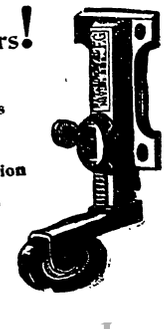
No more **S**lamming ...Doors!

Our Combination

Door Check Lock and Bumpers

Holds door in any position



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Pat. Jan. 20, 1880.

Out One-half Size.

Sample pair sent to any hardware or saddlery firm by addressing

The Frost Thill Spring Co.,

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A Full Line of Carriage Hardware

ALSO SPECIAL FORGINGS.

Estimates cheerfully given. Send for Catalogue

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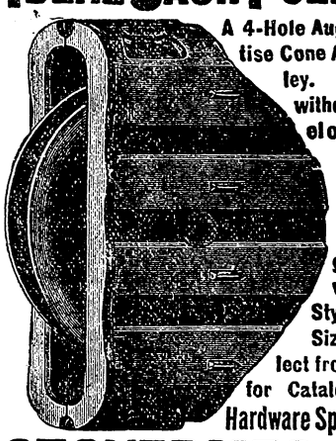

A 4-Hole Auger Mortise Cone Axle Pulley. Applied without chisel or Screws Each Pulley its own marking gauge. A variety of Styles and Sizes to Select from. Ask for Catalogue of Hardware Specialties

STOVER MFG. CO.

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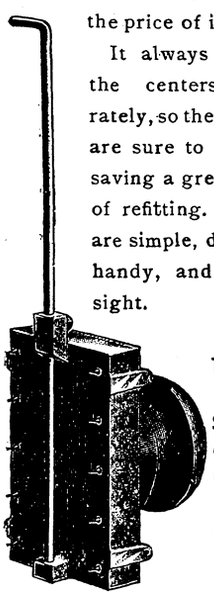
Grennan's Sash Pulley Marker for Common Sense Sash Pulleys.

Will mark in ten minutes what would take five hours to do the old way, saving the price of it the first time used.



It always marks the centers accurately, so the pulleys are sure to fit and saving a great deal of refitting. They are simple, durable, handy, and sell at sight.

Throop's Sash-Weight Fastener

Saves 2 cents a window in cost of material, saves time in putting on and makes a neater job than tie ing knots. Send for circulars and prices

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P. J. Conroy & Co.,

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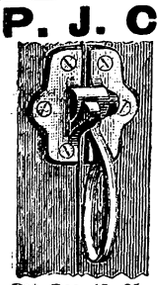

Pat. Dec. 15 ,85.

"CONROY"

Refrigerator Door Fasteners

Have rapidly supplanted all others.

Refrigerator Trimmings

RICHARD ECCLES,

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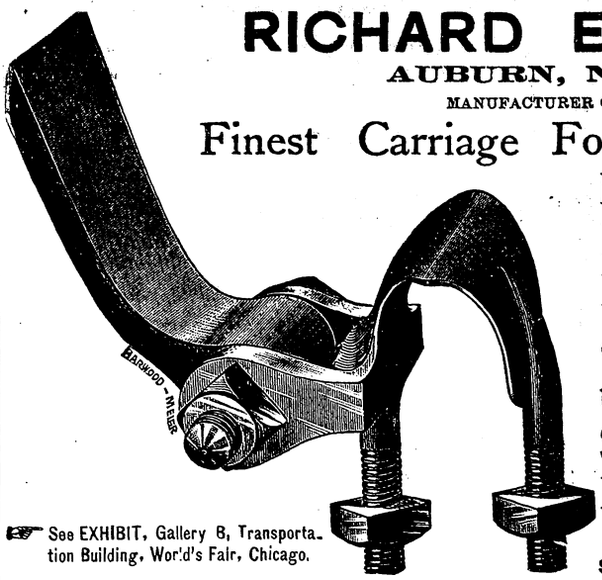

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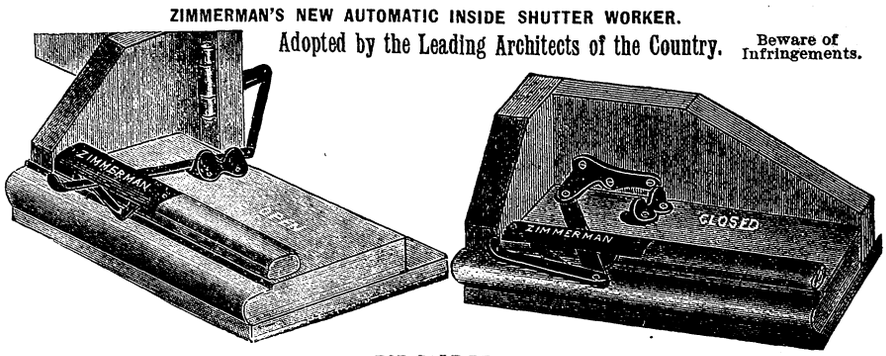

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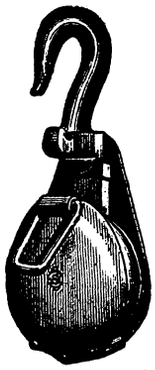

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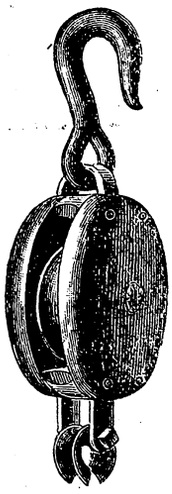

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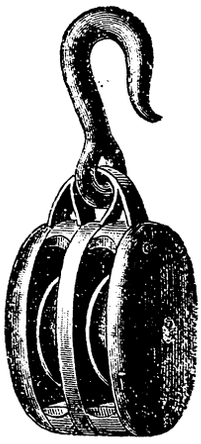

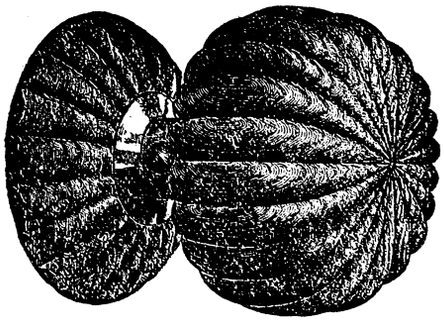

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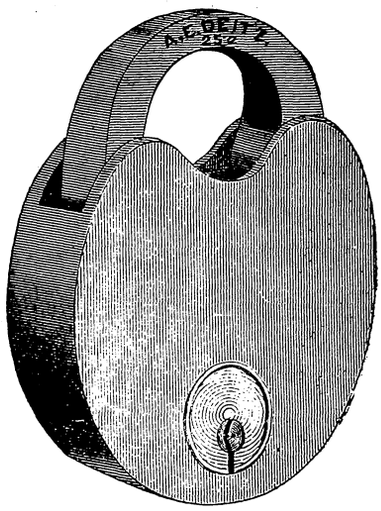

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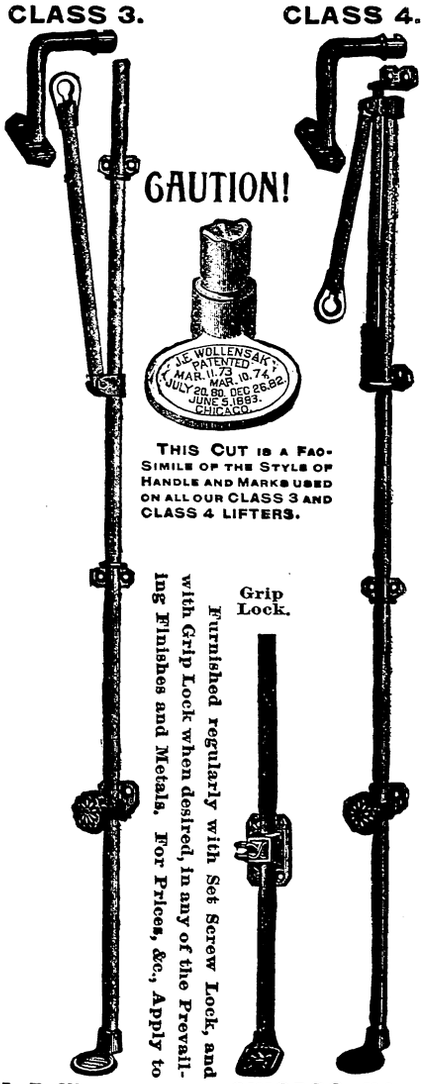

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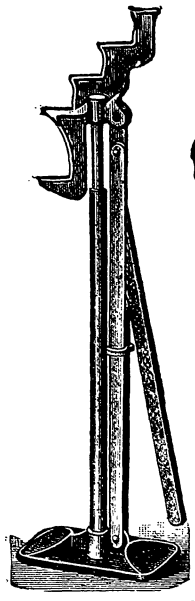

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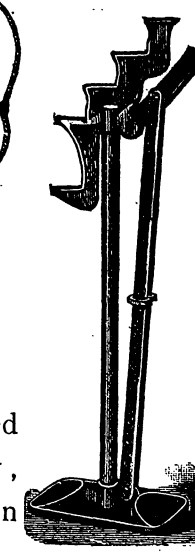

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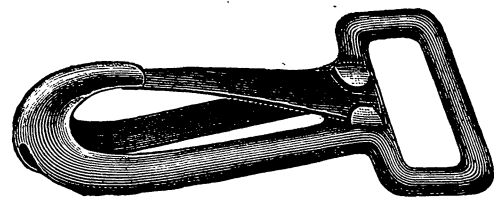

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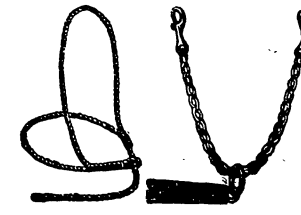

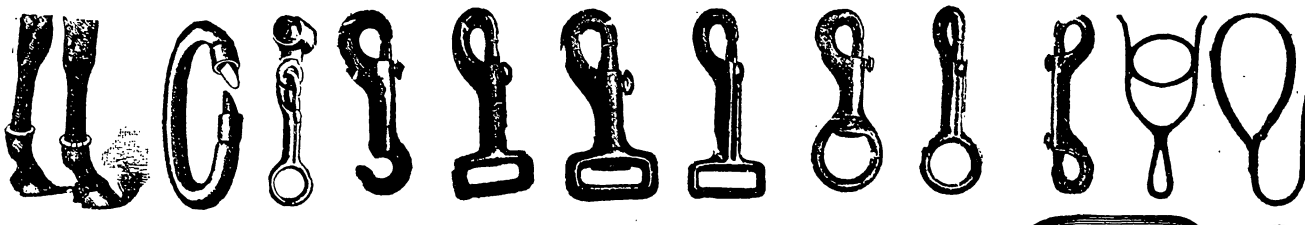

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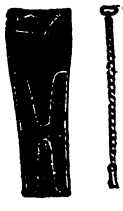

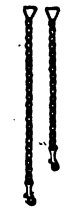

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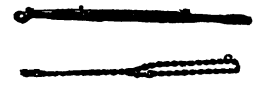

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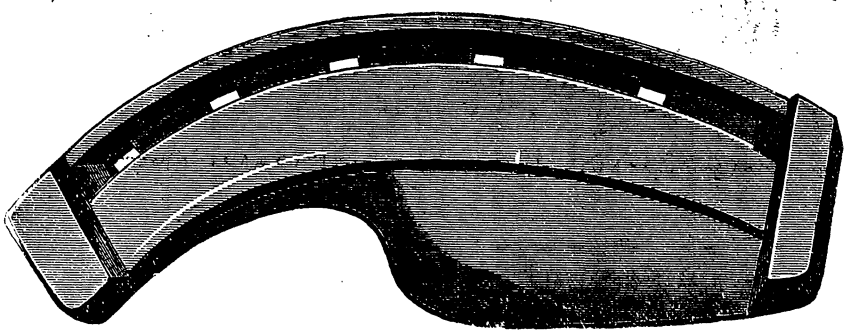

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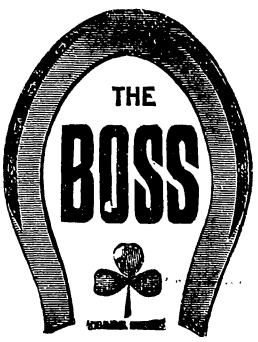

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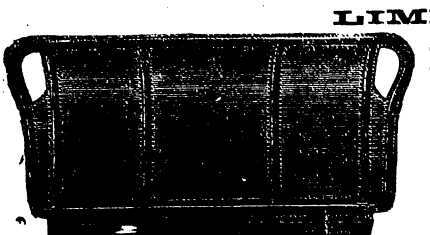

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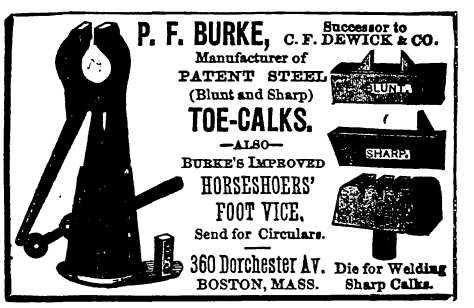

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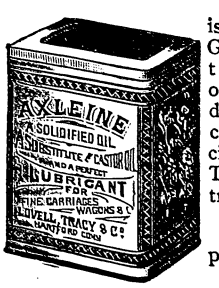

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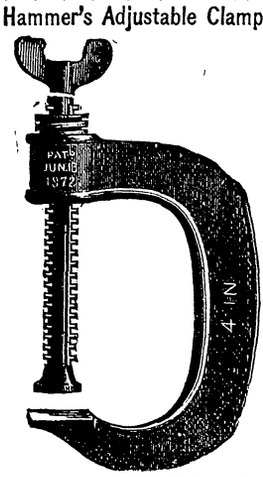

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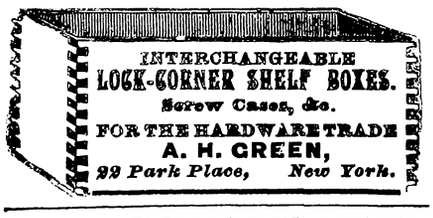

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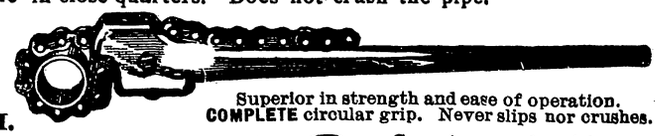

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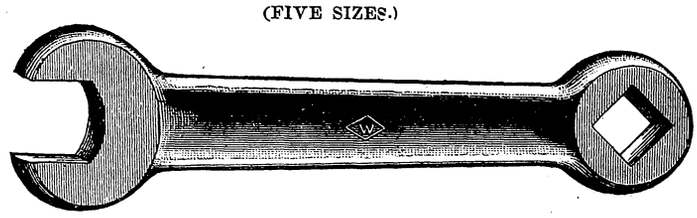

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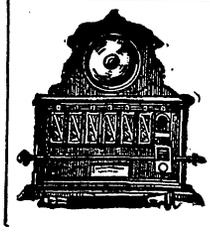

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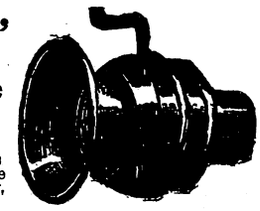

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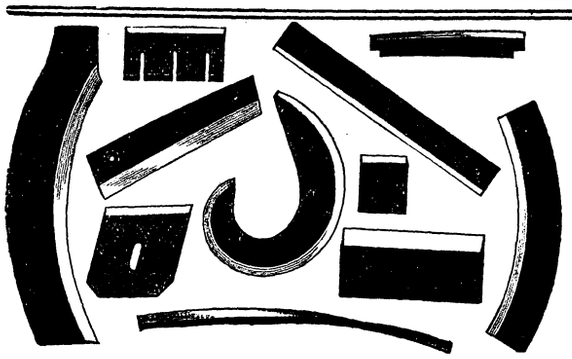

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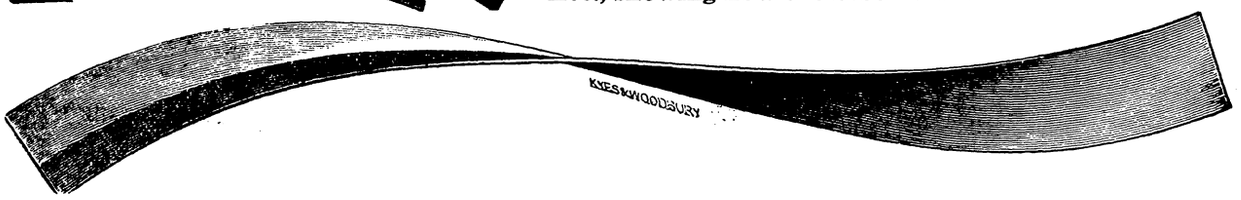

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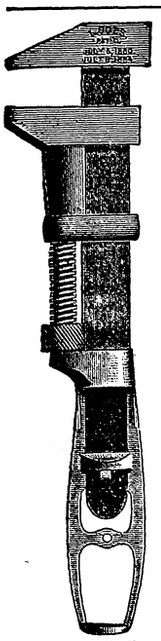

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KNIFE HANDLE

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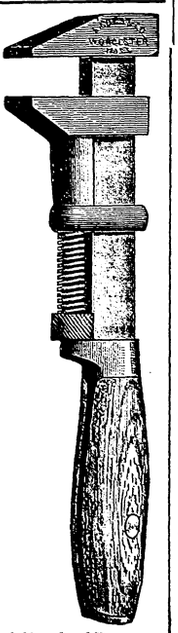

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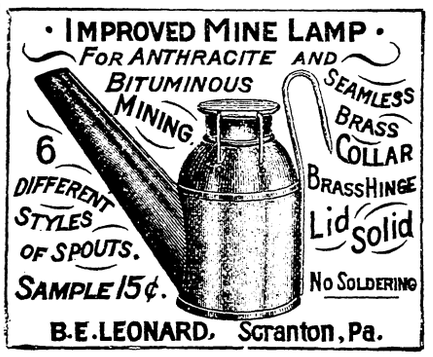
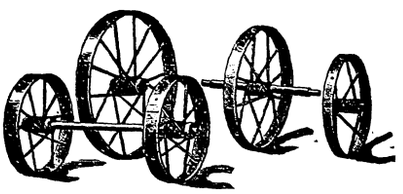


WHEELS, WHEELS, WHEELS.



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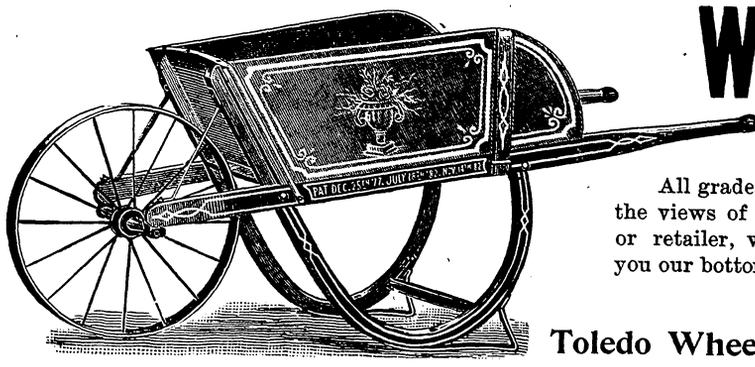

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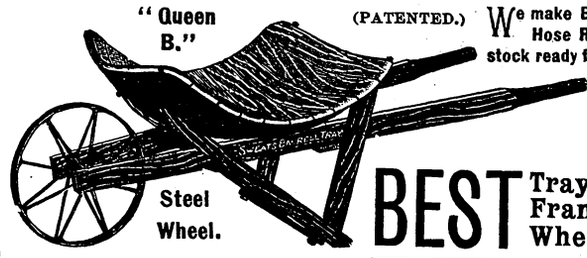

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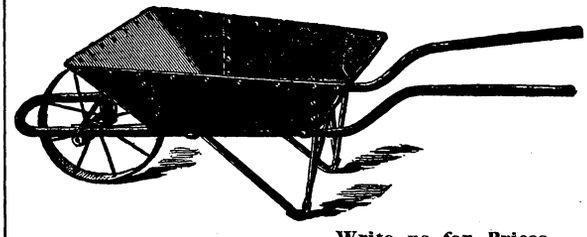

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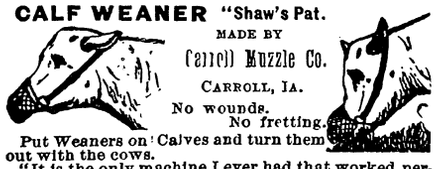

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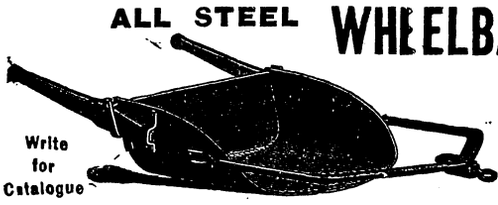

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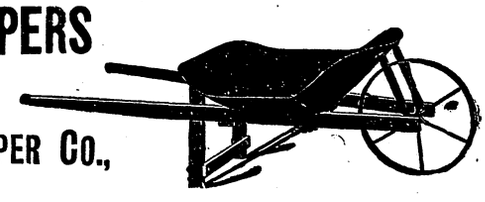

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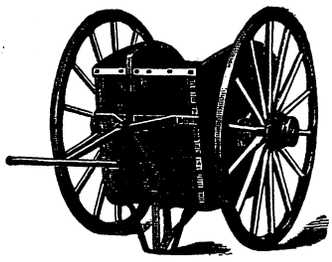
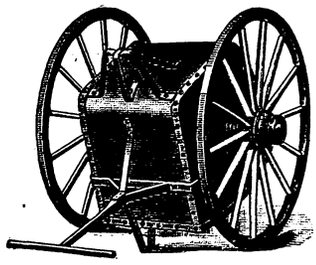
WHEELBARROWS AND ORE CARTS



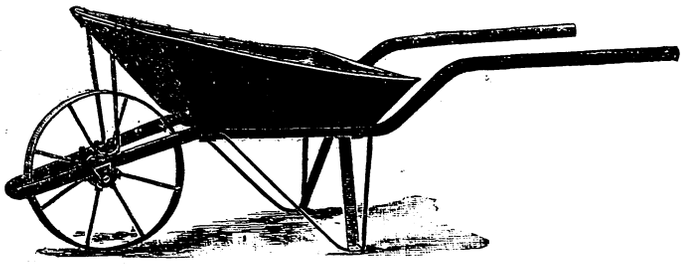


STEEL ORE CART.

Body made of No. 8 steel, banded around top with $\frac{1}{4}$ x $1\frac{1}{2}$ in. iron. To stiffen sides and support axle, a $\frac{1}{4}$ in. steel sheet 12 in. x 24 in., and a $\frac{3}{8}$ in. steel sheet 6 in. square is securely riveted to inside of body. The axle passes through the center of each sheet, and is riveted to body by iron hangers.

A steel shield is riveted to body over axles to prevent dirt from getting into the wheel-boxes and cutting them.

Wheels.—First quality wagon wheels 48 in. in diameter, painted, striped and varnished; $1\frac{1}{2}$ in x $\frac{1}{2}$ in. tire; 14 spokes. Axles.—Steel, $1\frac{3}{4}$ in. square. Body—Width, 24 in.; height, 33 in. length, 40 in. Handle—$1\frac{3}{8}$ in. iron. Legs and Braces—$\frac{3}{8}$ in x $1\frac{1}{2}$ in. and $\frac{1}{2}$ in. x $1\frac{1}{2}$ in. Weight complete, about 540 lbs.



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The trays of these barrows are made of one piece of steel, of the same thickness throughout. The expense of repairing wooden barrows is greater than the original cost, and the loss of time so increase the expense that the steel barrow is cheaper in the end

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A 3	Searcher	31 x 33	17	14	3	79	13.00
A 4	Seamless	31 x 33	17	12	3	84	14.00
A 5	Season	34 x 36	17	14	5	85	15.00
A 6	Seclude	34 x 36	17	12	5	90	16.25
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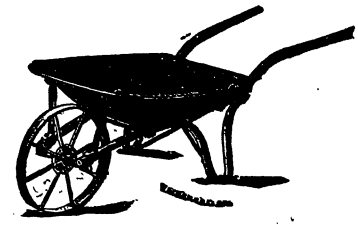

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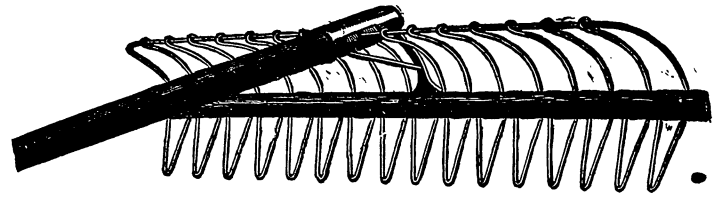

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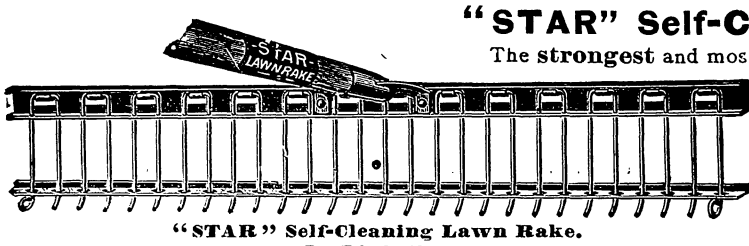

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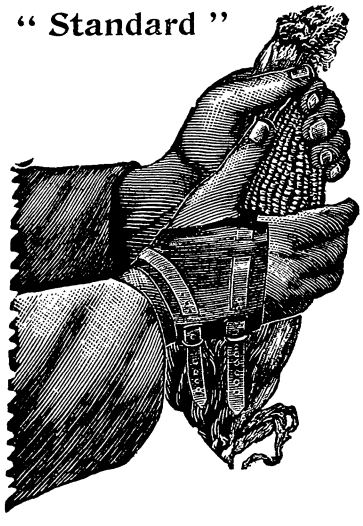

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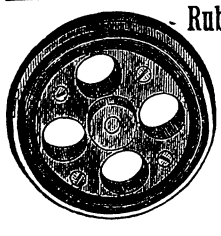

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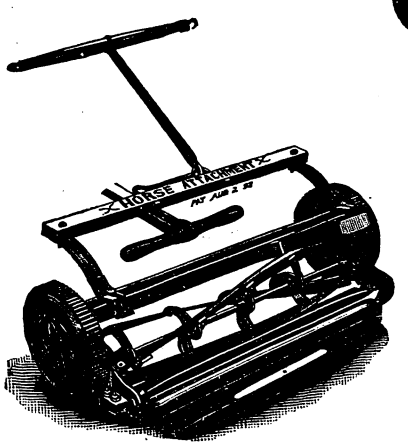

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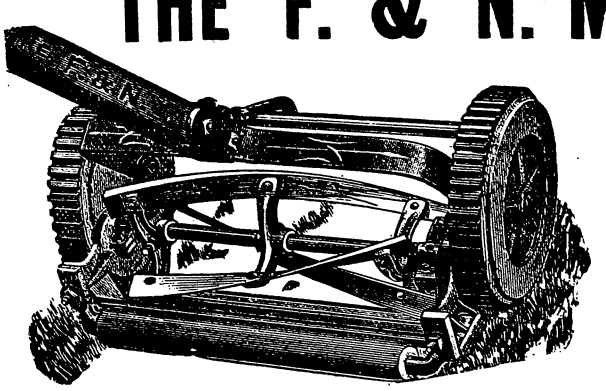

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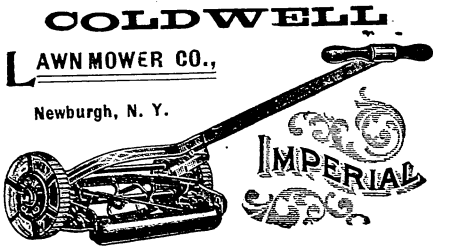

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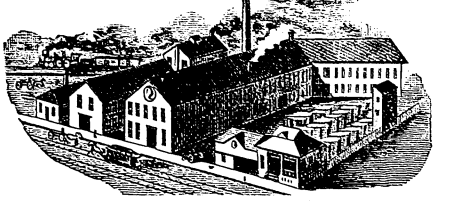

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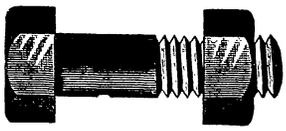

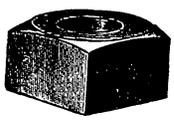

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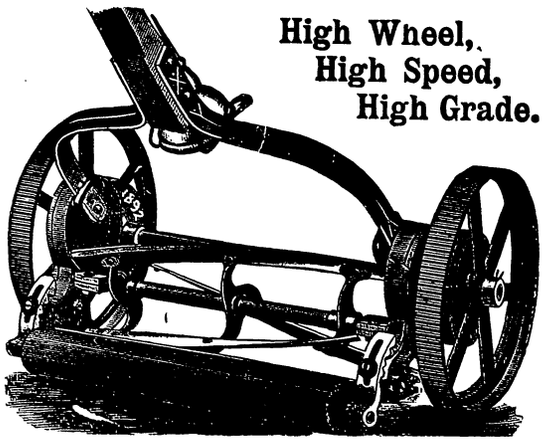

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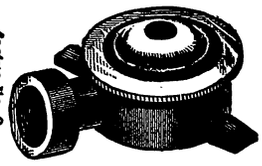

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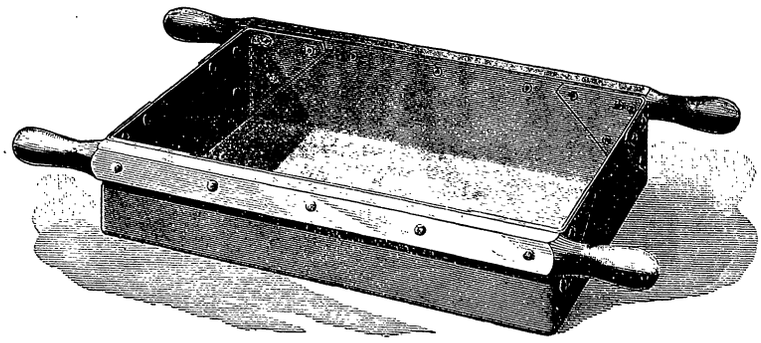

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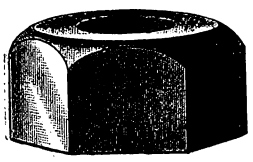

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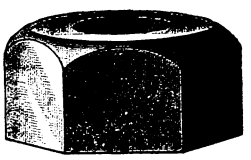

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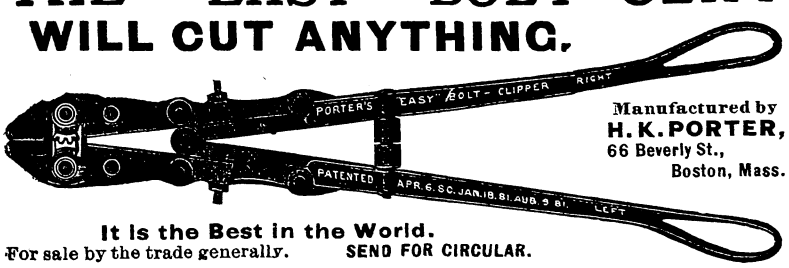

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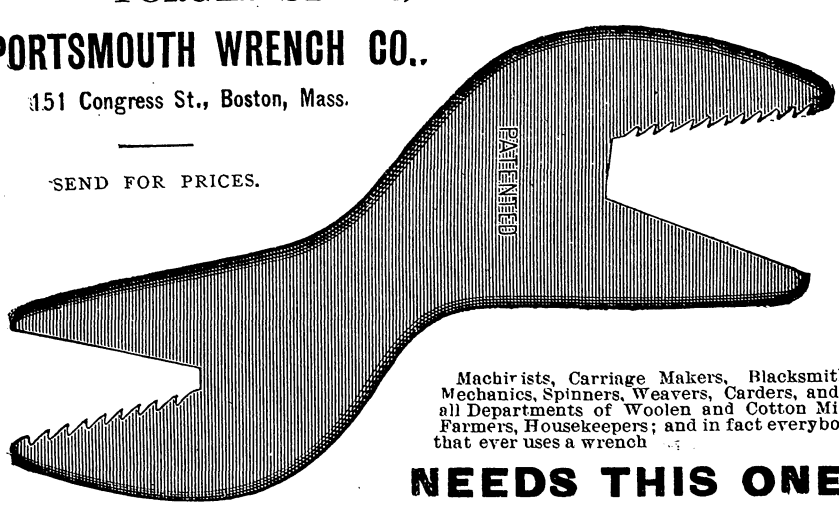

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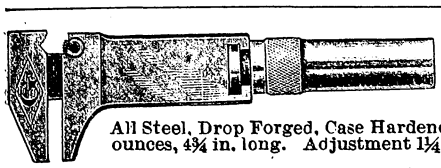

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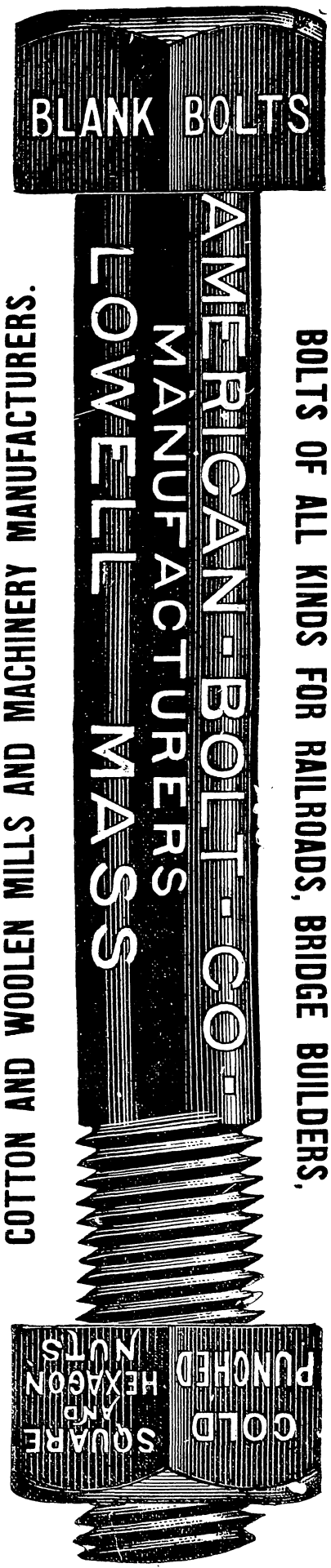

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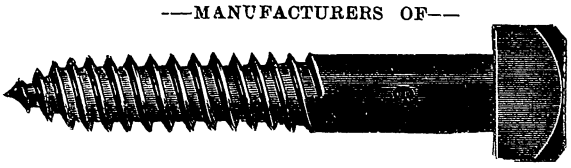

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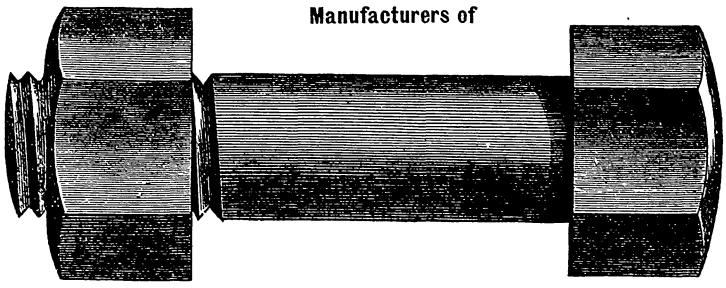

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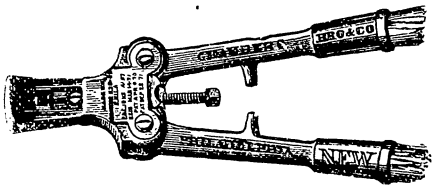

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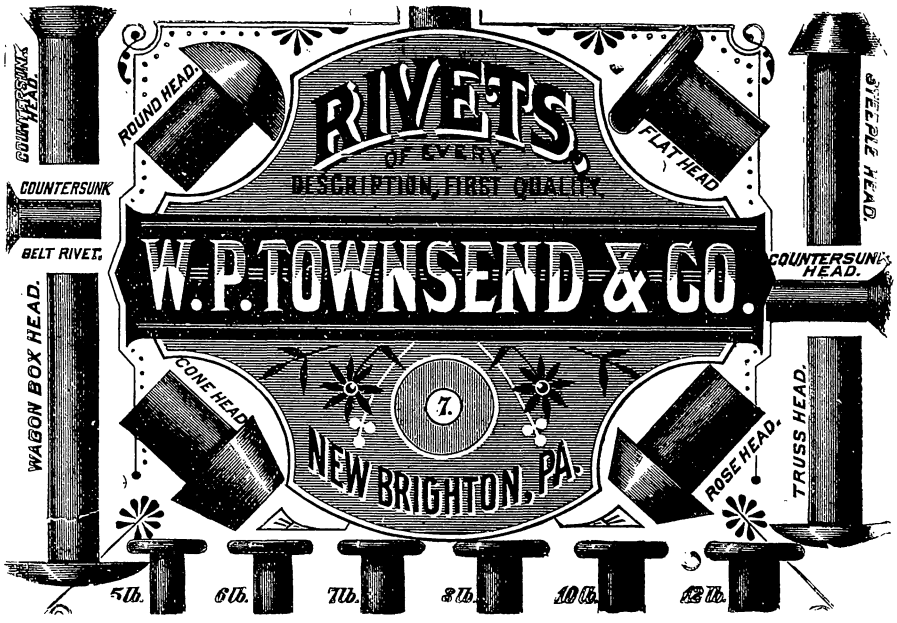

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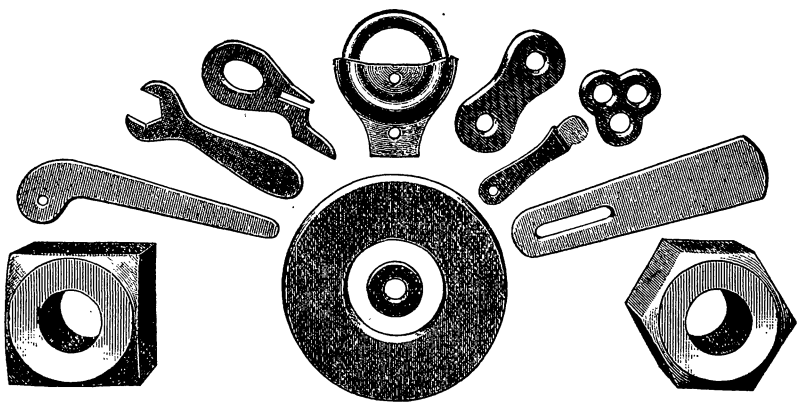

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Hurley Bros., Hartford, Conn.

Designer, Metal Work.
Arnold, F. H, New Brttain, Conn.

Dies.
Wilson, J. Fred, Worcester, Mass.

Dog Collars.
Chapman Mfg. Co., Meriden, Conn
Kelley & Woolworth, Niagara Falls, N. Y.
Union Hardware Co., Torrington, Ct.

Door Bells.
Graham, Jno. H. & Co., 113 Chambers St., N. Y.

Door Checks.
Utility Door Check Co., Chicago, Ill.

Door Knobs.
Bardsley J 149 & 151 Baxter St., N. Y

Drain Cleaners.
Buckeye Mfg Co., Union City, Ind.

Drilling Machines.
Bickford Drill & Tool Co., Cinn., Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Burnham, Geo. Co., Worcester, Mass
Champion Blower and Forge Co., Lancaster, Pa.
Colburn, A. L., New Haven, Conn.
Dallett, Thos. H. & Co., Philadelphia.
Dwight Slate Machine Co., Hartford Conn.
Halsey, Jas. T., Philadelphia, Pa.
Hamilton Mch. Tool Co., Hamilton, O.
Herrick & Cowell, New Haven, Conn.
Illinois Iron and Bolt Co., Carpentersville, Ill.
Norton & Jones Machine Tool Works, Plainville, Conn.
Quint, A. D., Hartford, Conn
Sellers, Wm. & Co., Inc., Phila., Pa
Sibley & Ware, So. Bend Ind.
Sigourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.
Smith Friction Drill & Tool Co., Boston, Mass.
Woodward & Rogers, Hartford, Conn.

Drop Forgings.
Belden Mach. Co., New Haven, Conn.
Billings & Spencer Co., Hartford, Conn
Boone, W. C. Mfg. Co., Boonton, N. J
Eccles, Richard, Auburn, N. Y.
Herbrand Co., Fremont, O.
Merrill Bros., Brooklyn, N. Y
Miner & Peck Mfg. Co., New Haven, Ct.
Phila. Drop Forge Co., Philadelphia, Pa.
Scranton Forging Co., Scranton, Pa.
Spiers, J. C. & Co., Worcester, Mass.
Williams, J. H. & Co., Brooklyn, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
Wyman & Gordon, Worcester, Mass.

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Drop Presses.
Bliss. E. W. Co., Brooklyn. N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Ferracute Mch. Co., Bridgeton. N. J.
Miner & Peck Mfg. Co., New Haven Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Vulcan Iron Works, Chicago, Ill.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Dumb Waiters.
Storm Mfg. Co., Newark, N. J.

Dust Beaters.
Peabody & Parks, Troy, N. Y.

Dynamite.
New York Powder Co., 62 Liberty St N. Y.

Dynamos.
C & C. Electric Motor Co., 402 and 404 Greenwich St., N. Y.
Detroit Dynamo Co., Detroit, Mich.
Lovell Mfg. Co., Ltd., Erie, Pa.
Zucker & Levett Chemical Co., 10 & 14 Grand St., N. Y.

Edge Tools. *Makers of.*
Amer. Axe & Tool Co., 280 B'way, N.Y.
Buck Bros., Millbury, Mass.
Butcher, W. & S., 135 Duane St., N. Y.
Buffalo Edge Tool Wks., Buffalo, N.Y
Plumb, Fayette R., Philadelphia, Pa.
Standard Axe & Tool Co., Ridgway, Pa.
Warren Axe & Tool Wks., Warren, Pa.
White, L. & I. J. Co., Buffalo, N. Y.

Egg Beaters.
North Bros. Mfg. Co., Philadelphia.

Electric Bells and Supplies.
Ostrander, W. R. & Co., 204 Fulton St., New York
Wollensak, J. F., Chicago, Ill.

Electric Welding.
Thomson Electric Welding Co., Boston, Mass.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor Conn
Hanson & Van Winkle Co., Newark, N J

Electro-Platers.
Boardman, L. & Son, East Haddam Ct.

Elevator Buckets.
W. J. Clark & Co., Salem, Ohio.

Elevators. *Makers of.*
Link-Belt Engineering Co., Phila., Pa
Moline Elevator Co., Moline, Ill.
Morse, Williams & Co., Phila., Pa.
Salem Fdry & Mch Co., Salem Mass.
Variety Mch. Co., Warsaw, N. Y.

Emery and Emery Wheels.
Bell, Geo. E., 36 John St. N. Y.
Grant Corundum Wheel Mfg. Co. Worcester, Mass.
N Y Belting & Packing Co., Ltd., N. Y
Northampton Emery Wheel Co Leeds, Mass.
Norton Emery Wheel Co., Worcester Mass.
Springfield Emery Wheel Mfg. Co Bridgeport, Conn.

Enamels.
Nubian Iron Enamel Co., Cragin, Ill

Engineers and Contractors.
Aiken Henry, Pittsburgh, Pa.
Artificial Gas Engineering Co., Pittsburgh, Pa.
Carten, Henry J., Pittsburgh, Pa
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa
Lean, D. R., Co., Pittsburgh, Pa.
McClure, Amster & Co., Pittsburgh, Pa
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.
Roberts, Frank C., Philadelphia, Pa.
Smythe, S. R. Co., Incorporated Pittsburgh, Pa.
Swindell W. & Bros., Pittsburgh, Pa
Wilkie, Bothwell & Co., Ltd., Pittsburgh, Pa.
Witherow, Jas. P. Co., Pittsburgh; Pa.

Engines, Gas.
Otto Gas Engine Works, Phila., Pa.
Rollason Gas Engine, Havemayer Bldg. N. Y.

Engines, Steam. *Makers of.*
Bass Foundry & Machine Works, Ft. Wayne, Ind.
Buckeye Engine Co., Salem, O.
Erie Engine Works, Erie, Pa.
Harrisburg Fdy. & Machine Works Harrisburg, Pa.
Lane & Bodley Co., Cincinnati, O
Norwalk Iron Works Co., So. Norwalk, Conn
Phila. Engineering Works, Phila., Pa.
Phœnix Iron Wks. Co. Meadville, Pa.
Shipman Engine Co., Boston, Mass.
Southwark Foundry and Machine Co. Phila., Pa.
Tod, William & Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.

Exhaust Tumblers.
Sweester, W. A., Brockton, Mass.

Expansion Bolts.
Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O

Faucets, Self-Measuring.
Lane Bros., Poughkeepsie, N. Y.

Faucets, Wooden. *Makers of.*
Boston & Lockport Block Co., Boston Mass., and Lockport, N. Y.
John Sommer's Son, Newark, N. J.

Feed-Water Heaters.
Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 32 Cortlandt St., N.Y
Harrison Safety Boiler Wks. Phila, Pa.
National Pipe Bending Co., New Haven, Conn.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Elmwood, Conn.

Fencing, Iron and Wire.
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
DeKalb Fence Co., DeKalb, Ill.
Gilbert & Bennett Mfg. Co., 42 Cliff St.,
Hartman Mfg. Co., Ellwood City, Pa.
Kilmer Mfg. Co., Newburgh, N. Y.
Mast, Foos & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
Reliance Wire & Iron Wks., Milwaukee

Fiber Ware.
Standard Fiber Ware Co., Mankato, Minn.

Figures and Letters, Metallic.
White, A. A. & Co., Providence, R. I.

Files. *Importers of*
Moss, F. W., 80 John, N. Y.

Files and Rasps, *Manufacturers of*
Banker & White, Troy, N. Y.
Barnett, G. & H., 41 & 43 Richmond Phila.
Butcher, W. & S., 135 Duane St., N. Y.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence R. I.

Fire Brick. *Makers of.*
Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer B. & Sons, foot E. Houston, St
McLeod & Henry Co., Troy, N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro., Woodbridge.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Fishing Tackle.
Dame, Stoddard & Kendall, Boston, Mass.

Flint and Emery Paper.
Baeder, Adamson & Co., Phila., Pa.

Flour Sifters.
Meyers, F. J. Mfg. Co, Covington, Ky.

Flower Stands.
Covington, S. E., Bellefontaine, O.

Fly Fans.
Matthai, Ingram & Co., Baltimore, Md

Fly Traps.
Cincinnati Mfg. Co., Cincinnati, O.

Fodder Cutters.
Silver Mfg. Co., Salem, O.

Forges, Portable, &c.
Bullock Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Empire Portable Forge Co., Lansingburg, N. Y.
Foos Mfg. Co., Springfield, Ohio.
Sturtevant, B. F. Co., Boston, Mass.

Forgings, Iron and Steel.
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel—Cambria Iron Co., Johnstown, Pa.
Scranton Forging Co., Scranton, Pa.

Foundry Facings.
Chicago Fdy. Supply Co., Chicago, Ill.
MacKellar Foundry Facing & Supply Co., Quincy, Ill.
Paxson, J. W. & Co., Phila.
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.

Foundry Riddles.
Estey, W. S. 65 Fulton, N. Y.

Foundry Supplies.
Chicago Fdy. Supply Co., Chicago, Ill.
Colliau, Victor, Detroit, Mich.
MacKellar Fdy. Facing & Supply Co., Quincy, Ill.
S. Obermayer Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia.
Smith, J. D. Fdy. Supply Co., Cinn., O

Friction Clutches.
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.

Fruit Presses.
Enterprise Mfg. Co. Philadelphia, Pa.

Furnaces, Foundry.
Byram & Co., Detroit, Mich.

Furnaces, Gasoline.
Burgess Soldering Fce. Co., Columbus, Ohio.

Garden Tools.
Dunlap, C. W., Box 2703, New York

Gas Producers.
Wood, R. D. & Co. Philadelphia, Pa.

Gas & Steam Fitters' Supplies.
Pancoast, Henry B. & Co., Phila., Pa.

Gauge, Rolling Mill.
Haines Gauge Co., Philadelphia, Pa.

Gear Cutters.
D. E. Whiton Mach. Co., New London, Conn.

Gears.
Boston Gear Works, Boston, Mass.
New Process Raw Hide Co., Syracuse, N. Y
Poole, Robt. & Son Co., Baltimore, Md
Union Fdy. & Mch. Co., Pittsburgh, Pa

Glass Boards.
Canton Saw Co., Canton, O.

Glass Tubes,
Ashcroft Mfg. Co., 111 Liberty St., N.Y.

Glass Cutters.
Monce, S. G., Bristol, Conn.

Glue.
Baeder, Adamson & Co., Phila., Pa.
Russia Cement Co., Gloucester, Mass.

Grass Catchers.
Supplee Hardware Co., Phila., Pa.
Thompson Mfg. Co., Elkhart, Ind.

Grinding and Polishing Machines.
Herrick & Cowell, New Haven, Conn.
Norton Emery Wheel Co., Worcester, Mass.
Washburn Shops, Worcester, Mass.

Grinding Mills.
Foos Mfg. Co., Springfield, O.

Grindstone Dressing Machinery.
Blake & Johnson, Waterbury, Conn.

Grindstones.
Cleveland Stone Co., Cleveland, O.

Gun Implements.
Union Hdw. Co., Torrington, Conn.

Gunpowder, *Makers of.*
Laflin & Rand Powder Co., 29 Murray St., N. Y.

Hand Carts.
Lansing Wheelbarrow Co., Lansing, Mich.

Hand Screws.
Grand Rapids Hand Screw Co., Grand Rapids, Mich.

Halter Chains.
Keller & Woolworth, Niagara Falls, N. Y.

Handles.
Hartwell, E. B., Gallipolis, Ohio.
New Process Raw Hide Co., Syracuse, N. Y
New York Mallet and Handle Wks. 456 E. Houston St., N. Y.

Hangers, Door.
Chicago Spring Butt Co., Chicago, Ill.
Cronk Hanger Co., Elmira, N. Y.
Lane Bros., Poughkeepsie, N. Y.
Victor Mfg. Co., Newburyport, Mass.

Hardware Comm'n Merchants.
Doscher, Martin, 88 Chambers, N. Y.
Field, Alfred & Co., 93 Chambers St., N. Y.
Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N.Y.

Hardware Manufacturers.
Dunlap, C. W., Box 2703, New York.
Russell & Erwin Mfg. Co., Chambers St., New York.
Hotchkiss, E. S. Bridgeport, Conn.
Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn

Hardware Mfrs. Agents.
Bingham, W. Co., Cleveland, O.
Graham, John H. & Co., 113 Chambers,
Hussey E J. & Co., 80 John St., N. Y.
McCoy, Jos F. Co., 26 Warren St., N. Y
Sickles, Sweet & Lyon, 35 Barclay, N. Y.
Underhill, Clinch & Co., 94 Chambers St., N. Y.

Hardware Specialties.
Acme Shear Co., Bridgeport, Conn.
Belden Machine Co. New Haven, Conn.
Clark Mfg. Co., Buffalo, N. Y.
Empire Portable Forge Co., Lansingburg, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Gwinner Mfg. Co., Hamilton, O.
Haines & Zimmerman, Phila Pa.
Hart, H. C Mfg. Co., Detroit, Mich.
Henn, A. S. & Co., New Haven, Conn
Johnson, S. C., Racine, Wis.
Knapp & Cowles Mfg. Co., Bridgeport, Conn.
North Bros. Mfg. Co., Philadelphia, Pa
Peabody & Parks, Troy, N. Y.
Welland, Chas., 143 Chambers St., N.Y
Wilson, J. Fred, Worcester, Mass.
Wire Goods Co., Worcester, Mass.
Underhill, Clinch & Co., 94 Chambers Street, N. Y

Hardware, Yacht and Ship.
Ferdinand, L. W. & Co., Boston, Mass.

Harness Snaps.
Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks., Farmer, N.Y.
Fitch, W. & E. T., New Haven, Conn.

Hay Knives.
Holt, Hiram, Co., E. Wilton, Me.

Hoisting Machines.
Box, Alfred & Co., 314 Green, Phila.
Brown Hoisting & Conveying Mch. Co. Cleveland, Ohio.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E., Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 96 Liberty, N. Y.
Maris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Speidel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.

Hollow-Ware.
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
Stuart & Peterson Co., Phila., Pa.

Holloware, Aluminum.
Illinois Pure Aluminum Co. Lemont, Ill

Horse and Barbers' Clippers.
Hotchkiss, E. S., Bridgeport, Conn.

Horse Nails, *Makers of.*
National Horse Nail Co., Vergennes, Vt.
Standard Horse Nail Co., New Brighton, Pa.

Horse Shoes, *Makers of.*
Bryden Horse Shoe Co., Catasauqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phœnix Horse Shoe Co., Poughkeepsie N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Standard Horse Shoe Co., Boston, Mass.

Hose.
Cleveland Rubber Co., Cleveland, O.
N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

Hotels.
The Audubon, Chicago, Ill.

Hydrants, &c.
McLean, John, 296 & 298 Monroe, N.Y.

Hydraulic Jacks.
Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 43d, N. Y.

Ice-Cream Freezers.
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.

Ice Shavers.
Enterprise Mfg. Co., Philadelphia, Pa.

Ice Tongs.
Stoppard, Robt, Auburn, N. Y.

Injectors.
Jenkins Bros., New York
Sherwood Mfg. Co., Buffalo, N. Y.

Insurance, Boiler.
Hartford Steam Boiler Inspection & Insurance Co. Hartford Conn.

Iron and Steel, Swedish.
Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.

Iron Commission Brokers.
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Bradley & Co., Philadelphia.
Etting, Edw. J., Philadelphia.
Hogan, John L. & Co., Philadelphia Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lea, J. Tatnall & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Mann, E. R. & Co., Philadelphia.
Pilling & Crane, Philadelphia, Pa.
Sibell, Geo. H. & Co., Chicago, Ill.
Wilhelm & Co., Harrisburg, Pa.
Wister, L. & R. & Co., Phila., Pa.

Iron Ore.
Naylor & Co., 45 Wall, N. Y.
Pickands, Brown & Co., Chicago, Ill.
Pullman, J. Wesley, Phila., Pa.
Samuel, Frank, Philadelphia, Pa.

Iron, *Merchants.*
Barnes, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Bussenius & Cunliffe, Philadelphia.
Corning Edw. & Co., 29 B'way, N. Y.
Cox, Justice, Jr., Philadelphia
Cotton, Bradley & Co., Philadelphia
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Naylor & Co. 45 Wall St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 85 Elm St. N. Y
Pickards, Brown & Co., Chicago, Ill.
Pierson & Co., 29 Broadway, N. Y.
Richards, D. W. & Co., 88 Maiden St. N. Y.
Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, E. H. & Co., Philadelphia.

Iron, *Importers.*
Abbott, Jere & Co., N. Y. and Boston.
Lundberg, Gustaf, Boston, Mass.

Iron, Sheet. *Manufacturers of.*
Cambridge Iron & Steel Co., Cambridge Ohio
W. Dewees Wood Co., Lim., McKeesport, Pa.

Ironwork, Ornamental.
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Lange Fence & Wire Co., St. Louis, Mo.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Foos & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.

Keys.
Wollensak, J. F., Chicago, Ill.

Kraut Cutters.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Ladders.
Davies, Chas. & Co., Williamsport, Pa.

Ladles.
Detroit Fdy. Equipment Co., Detroit, Mich.

Lamp Stoves.
Glazier Stove Co., Chelsea, Mich.

Lamps.
Standard Lighting Co, Cleveland, O.

Lanterns.
Dietz R. E., Co., 60 Laight St, N. Y.
Ohio Lantern Co., Tiffin, Ohio.
Steam Gauge & Lantern Co., Syracuse, N. Y.

Lathes.
Draper Machine Tool Co., Worcester, Mass.
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.
Seneca Falls Mfg. Co., Seneca Falls N. Y.

Lathing, Wire.
Clinton Wire Cloth Co., Clinton, Mass
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Laundry Machines.
Johnson, S. C., Racine, Wis.

Lawn Mowers.
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.
Champion Mfg. Co., Richmond, Ind.
Coldwell Lawn Mower Co., Newburg N. Y.
F. & N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.
Lape, W. E., Syracuse, N. Y.
Mast, Foos & Co., Springfield, O.
Stearns, E. C. & Co., Syracuse, N. Y.
Supplee Hdw. Co., Phila. Pa.

Lawn Rakes.
Schaeffer & Co., Dayton, Ohio.
Syracuse Specialty Mfg. Co., Syracuse N. Y.

Lawn Sprinklers.
Ette & Henger Mfg. Co., St. Louis.
McGowan, John H. Co., Cincinnati, O.

Lawn Sweepers.
Lape, W. E., Syracuse, N. Y.

Lawn Swings.
Davies, Chas & Co., Williamsport, Pa

Lemon Squeezers.
Ripley Mfg. Co., Unionville, Conn.

Letters, Paper.
Tablet & Ticket Co., Chicago, Ill.

Levels.
Davis & Cook, Watertown, N. Y.
Richardson, C. F., & Son Athol, Mass.

Locks & Knobs. *Manufacturers of*
Deitz, A. E., 97 Chambers, N. Y
Keyless Lock Co., Chicago, Ill.
Reading Hdw Co. Reading, Pa.
Romer & Co., Newark, N. J.
Russell & Erwin Mfg. Co., New York.
Smith & Egge Mfg Co. Bridgeport, Conn
Yale & Towne Mfg. Co., Stamford, Conn

Lubricators.
Wadham's Oil & Grease Co., Milwaukee Wis.

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Machinery.
Am. Tool Works, Cleveland, Ohio.
Barnes, W. F. & John, Rockford, Ill.
Becker Jno. Mfg. Co., Fitchburg, Mass
Bement, Miles & Co., Philadelphia, Pa.
Bigelow, C. E., 45 Dey, N. Y.
Bignall & Keeler Mfg. Co., St. Louis.
Birmingham Iron Foundry, Birmingham, Conn.
Bliss, E. W. Co., Brooklyn, N. Y.
Bogert, Jno. L., Flushing, N. Y.
Briggs, Marvin, 12 Broadway, N. Y.
Carlin's Sons, Thos., Allegheny, Pa.
Cinn. Milling Mch. Co., Cincinnati, Ohio.
Clapp, Geo. M., agt., 74 Cortlandt, N.Y
Coulter & McKenzie Mch. Co., Bridgeport, Conn.
Cruikshank, D. B., Providence, R. I.
Detrick & Harvey Mch. Co., Baltimore, Md.
Ehrhardt, Gustave & Sons Pittsburgh, Pa.
Fitchburg Mch. Works, Fitchburg Mass.
Garvin Mch. Co., Laight & Canal Sts
Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila. Pa.
Hendey Machine Co., Torrington, Ct
Henley Mch. Tool Wks, Richmond, Ind
Hill, Clarke & Co., Boston, Mass.
Ingersoll Milling Machine Co., Rockford, Ill.
Johnson, Israel H., Jr., & Co., Phila.
Jones & Lamson Mch. Co., Springfield, Vt
Kelly, Daniel, Phila., Pa.
Lodge & Shipley Mch. Tool Works Cincinnati, O.
Lovegrove & Co., Philadelphia, Pa.
McCabe, J. J., 68 Cortlandt, N. Y.
Machinists Supply Co. Rochester, N. Y
Manville, E. J. Mch. Co, Waterbury, Conn
Morton Mfg. Co., Muskegon Heights, Mich.
National Machinery Co., Tiffin, Ohio
Newark Mch. Tool Works, Newark, N.J
New Haven Mfg. Co., New Haven, Conn
New York Mach'y Depot, N. Y.
Niles Tool Wks., 138 Liberty St., N. Y.
Pedrick & Ayer, Philadelphia, Pa.
Pittsburgh Mfg. Co., Pittsburgh, Pa.
Place, Geo., 120 Broadway, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.
Powell Planer Co., Worcester, Mass.
Pratt & Whitney Co., Hartford, Conn
Prentiss Tool & Supply Co., N. Y
Scranton Supply & Mchry. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfert's Sons L. F., Philadelphia, Pa
Steptoe, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Ld., Phila.
Toomey, Frank, Philadelphia, Pa.
Wetherill, Robert & Co., Chester, Pa.
Wilson, W. A., Rochester, N. Y.
Woodruff Mfg. Co. Hartford, Conn.

Machinery for Hardware Manufacture.
Adt, Jno. & Son, New Haven, Conn.

Machine Knives.
Loring Coes & Co., Worcester, Mass
Loyd, John, 558-562 Water St., N. Y.

Machine Tools.—*See Machinery.*

Machine Work.
Papping, J., 58th St., & 11th Ave., N.Y. City.

Machinists' Scales.
Coffin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.

Machinists' Tools and Supplies
King, J. M. & Co., Waterford, N. Y.
Sellers, Wm. & Co., Inc., Phila.

Mallets.
N. Y. Mallet & Handle Works, N. Y.

Mangles.
Johnson, S. C., Racine, Wis.

Measuring Tapes.
Lufkin Rule Co., Saginaw, Mich.

Meat Cutters.
Enterprise Mfg. Co., Philadelphia, Pa.

Metals.
Fearing, Wm. S., 100 Chambers, N. Y
Hendricks Bros., 49 Cliff, N. Y.
Naylor & Co., 45 Wall, N. Y.

Metal Brokers.
American Metal Co., N. Y.

Metallurgists.
Britton, J. Blodgett, Phila.

Metal Saws.
Ehrhardt, Gustave & Sons, Pittsburg
Q & C Co., Chicago, Ill.

Milling Machines.
Cin. Milling Mch. Co., Cincinnati, Ohio.
Ingersoll Milling Machine Co., Rockford, Ill.
Pedrick & Aver, Phila, Pa.

Mincing Knives.
Palmer Hdw. Mfg. Co., Troy, N. Y.

Mine Lamps.
Darby, Edw. & Sons Phila. Pa
Leonard, B. E., Scranton, Pa.
Leonard, T. F., Scranton, Pa.

Mining Screens.
Harrington & King Perforating Co Chicago, Ill.
Hendrick Mfg. Co., Ltd., Carbondale, Pa.
Howard & Morse, 45 Fulton, N. Y

Mirrors.
Rice, C. F., Chicago, Ill.

Mitre Boxes.
Olmsted, L. H., Hasbrouck Heights, N. J.

Molding Sand.
Chicago Foundry Supply Co., Chicago, Ill.
Obermayer, S. Co, Cincinnati, O.
Paxson, J. W. & Co., Phila.

Motors, Water and Electric.
C. & C. Electric Motor Co., 402 and 404 Greenwich St., N. Y.
Dallett, Thos. H. & Co., Phila., Pa.
Thomson, Houston Motor Co., Boston, Mass.

Nail Machinery.
Pittsburgh Mfg. Co., Fittsburgh, Pa.

Nails (Cut) and Spikes.
Borden & Lovell, 70 West, N. Y.
Cumberland Nail & Iron Co., Phila.
Oxford Iron Co., 81 Washington, N.
Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Wks, Wheeling, W. Va.

Nickel Platers' Supplies
Eddy Electric Mfg. Co., Windsor, Conn
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett Chemical Company. 10 to 14 Grand St., N. Y

Norway Shapes, *Rollers of.*
Rowland, William & Harvey, Frankford, Philadelphia

Nut Machines.
Dunham Nut Mch. Co., Unionville, Ct

Nuts, Bolts, &c., *Makers of.*
American Bolt Co., Lowell, Mass.
American Screw Co., Providence, R. I
Blake & Johnson, Waterbury Conn.
Haskell, Wm H. Co., Pawtucket, R. I.
Mt. Carmel Bolt Co, Mt. Carmel, Conn.
Port Chester Bolt and Nut Co., Port Chester, N. Y.
Russell, Burdsall & Ward, Port Chester
Sternbergh, J. H. & Son, Reading, Pa.
Wilson, J. Fred., Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, R.

Oil Cups and Lubricators.
Sherwood Mfg. Co., Buffalo, N. Y.

Oil Stones.
Pike Mfg. Co., Pike Station, N. H.

Oil Stoves.
Glazier Stove Co., Chelsea, Mich.

Orange Shears.
Henry, J. T., Mfg Co., Hamden, Conn.

Ores.
Wister, Francis, Philadelphia, Pa.

Ox Shoes.
Scranton Forging Co., Scranton, Pa.

Packing.
Billington, Jas. H. & Co., Phila., Pa.
Morrison, Robt., St. Louis, Mo.
N. Y. Belting & Packing Co. Ltd., N.Y.

Padlocks.
Ames Sword Co., Chicopee, Mass.
Fraim, E. T., Lancaster, Pa.
Hillebrand & Wolf, Phila., Pa.
Miller Lock Co., Philadelphia, Pa.

Paint.
Detroit Grapnite Mfg. Co., Detroit, Mich.
Dixon, Jos. Crucible Co., Jersey City, N.J
Garry Iron & Steel Roofing Co., Cleveland, O.

Paint Burners.
Dangler Stove & Mfg. Co., Cleveland, O

Patent Solicitors.
Fitzgerald, S. C., Washington, D. C.
Howson & Howson, Phila. & Wash'gton.
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.

Peanut and Coffee Roaster.
Olsen, A. B., Kansas City, Mo.

Perforated Metal.
Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co. Chicago, Ill.
Hendrick Mfg. Co, Ltd., Carbondale, Pa.

Phosphor Bronze.
Phosphor Bronze Smelting Co., Limited, 512 Arch, Philadelphia.

Phosphor Tin.
Crescent Phosphorized Metal Co., Philadelphia, Pa.
Crosby Steam Gauge & Valve Co., Boston, Mass.
Halk & Naumann, 516 Pearl, N. Y.

Picks and Mattocks.
Plumb, Fayette R., Philadelphia, Pa.

Pig Iron.
Houston, C. B. & Co., Philadelphia, Pa
Mann, Edwin R., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.
Naylor & Co., 45 Wall, N. Y.
Pickands, Brown & Co., Chicago, Ill.
Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.

Pig Iron Storage.
Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

Pile Drivers.
Vulcan Iron Wks., Chicago, Ill.

Pipe, Bent.
National Pipe Bending Co., New Haven

Pipe Cutting and Threading Machines.
Bignall & Keeler Mfg. Co., St. Louis, Mo.
Merrill Mfg. Co., Toledo, O.
Pancoast Henry B. & Co., Philadelphia.
Saunder's Sons, D., Yonkers, N. Y.

Pipe Grips.
Prentiss Vise Co., 44 Barclay, N. Y.

Pipes, Fittings, &c., *Makers of.*
McNab & Harlin Mfg. Co., N. Y.

Pipe, Water and Gas. *Makers of.*
Cumberland Nail & Iron Co., Phila, Pa
Donaldson Iron Co., Emaus, Pa.
Riverside Iron Works, Wheeling, W Va.
Wood, R. D. & Co., Philadelphia, Pa.

Plane Irons, *Manufacturers of.*
Buck Bros., Millbury, Mass.

Planes, *Manufacturers of.*
Stanley Rule & Level Co., N. Y

Plate Bending Rolls.
Schneekloth, H. A., 530 W. 28th St., N.Y

Plate, Iron and Steel, *Mfrs of*
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cukens Iron & Steel Co., Coatesville, Pa.
Mahoning Valley Iron Co., Youngstown, Ohio.
Moorhead-McLean Co., Pittsburgh, Pa.
McIlvain & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville, Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Wellman Iron & Steel Co., Thurlow, Pa
Wood Alan Co., Philadelphia.

Plating, Nickel, Brass and Silver.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Plumbago.
Chicago Fdy. Supply Co., Chicago, Ill

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Polishing Machines.
Watson & Stillman, 204 E. 43d, N. Y.

Polishing Wheel.
La Massena, C. E. & Co., Newark, N.J.

Post Hole Diggers.
Buckeye Mfg. Co., Union City, Ind.
Kohler, F. E. & Co. Canton, O
Wister, L & R, & Co., Philadelphia, Pa.

Poultry Nettings.
Barnum, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y
N. J. Wire Cloth Co., Trenton, N. J.
"Silver Finish."
Tyler Wire Wks Co., W. S., Cleveland, O.
Wright & Colton Wire Cloth Co., Worcester, Mass.

Powder.
Laflin & Rand Powder Co., 29 Murray
New York Powder Co., 62 Liberty St., N. Y

Power Hack Saws.
Millers Falls Co., 93 Reade St., N. Y.
Stover Novelty Wks., Freeport, Ill.

Power Hammers.
Belden Mach. Co., New Haven, Conn.
Dienelt & Eisenhardt, Philadelphia.
Dupont Mfg. Co., St. Johnsbury, Vt.
Jenkins & Lingle, Bellefonte, Pa.

Presses, Dies, &c.
E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Ferracute Mch. Co., Bridgeton, N. J.
Stark Mch & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Waterbury Mch. Co., Waterbury, Conn

Presses, Power. *Makers of.*
Bliss, E. W. Co., Brooklyn, N. Y.
Manville, E. J. Mch. Co., Waterbury, Ct,
Merriman, A. H., Meriden
Robinson, J. M. & Co., Cincinnati, O.
Stark Mch. & Tool Co., Buffalo, N. Y.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Pulley Fixings.
Foley, J. W. & Co., Cincinnati, O.

Pulleys.
Great Western Pin Co., Toledo, O.
Keystone Clutch, Mch. Wks., Phila., Pa.
Reeves Pulley Co., Columbus, Ind.

Pulverizing Mill.
Bradley Fertilizer Co., Boston, Mass.

Pumping Machinery.
Coulter & McKenzie Mch. Co., Bridgeport, Conn.
Dean Bros. Steam Pump Works, Indianapolis, Ind.
Goulds Mfg. Co., Seneca Falls, N. Y.
Hooker-Colville Steam Pump Co., Chicago, Ill.
Lucas, C. O. & Co., Greenville, Ohio.
McGowan, J. H. & Co., Cincinnati, O.
Maslin, J. & Son, Jersey City, N. J.
Norwalk Iron Wks. Co., So. Norwalk, Conn.
Southwark Fdy. & Mch. Co., Phila., Pa
Valley Pump W'ks, Easthampton Mass
Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Pumps. *Makers of.*
Bellevue Pump Co., Bellevue, Iowa.
Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Mast, Foos & Co., Springfield, O.
Myers, F. E. & Bro., Ashland, O.

Punches and Shears, Hand and Power.
Bertsch & Co., Cambridge City, Ind.
E. W. Bliss Co., Brooklyn, N. Y.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Crosby, G. A. & Co., Chicago, Ill.
Ferracute Mch. Co., Bridgeton, N. J.
New Doty Mfg. Co., Janesville, Wis.
Robinson, J. M. & Co. Cincinnati, O.
Schneekloth, H. A., 530 W. 28th St. N.Y
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Wais & Roos, Punch & Shear Co., Cincinnati, Ohio.
Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.
Watson & Stillman, 204 E. 43d, N. Y.

Rails, Old and New.
Hirsh, L. K., Chicago, Ill.
Perry, W. H. & Co., Providence, R. I.
Schwarzenberg Bros. & Co, Cleveland O

Rat and Mouse Traps.
Burditt & Williams, Boston, Mass.
Estey, W. S. 65 Fulton, N. Y.
Ripley Mfg. Co., Unionville, Conn.
Sun Mfg. Co., Greenfield, O.

Razors.
Butcher, W. & S., 135 Duane St., N. Y.
Curley, J. & Bro., 6 Warren St., N. Y.
Electric Cutlery Co., 113 Chambers, N.Y
Schmitz, E. Lothar, 92 Reade St., N.Y.
J. R. Torrey Razor Co., Worcester, Mass

Refrigerator Door Fasteners.
Conroy, P. J. & Co., Philadelphia.

Rivets.
Blake & Johnson, Waterbury, Conn.
Burden Iron Co., Troy, N. Y.
Cobb & Drew, Plymouth, Mass.
Henderson, Jas. S., 165 Greenwich, N.Y.
Plymouth Mills, Plymouth, Mass.
Sternbergh, J. H. & Son, Reading, Pa.
Townsend, W. P. & Co., New Brighton Pa.

Riveting Machines.
Adt, Jno. & Sons, New Haven, Conn.

Roasters and Bakers.
Matthai, Ingram & Co., Baltimore, Md.

Rock Drills.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Rand Drill Co., 23 Park Place, N. Y.

Rolling Mill Machinery.
Birmingham Iron F'dry, Birmingham, Conn.
Booth, The Lloyd, Co., Youngstown, O.
Leechburg Foundry & Mch. Co., Pittsburgh, Pa.
Mahoning F'dry & Mch. Co., Danville, Pa.
Morgan Construction Co., Worcester, Mass.
Robinson-Rea Mfg. Co., Pittsburgh.
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
Trethewey Mfg. Co., Pittsburgh, Pa.
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

Roll Lathes.
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.

Rolls, Chilled, Sand and Steel.
Booth, The Lloyd, Co., Youngstown, O.
Garrison, A. Fdry. Co., Pittsburgh, Pa.
Johnson Foundry Co., Johnstown, Pa.
Seaman, Sleeth & Black, Pittsburgh.
Totten & Hogg Iron and Steel Fdry Co., Pittsburgh Pa.

Roofing.
Berlin Iron Bridge Co., E. Berlin, Conn
Boston Bridge Works, Boston, Mass.
Cambridge Roofing Co., Cambridge, O.
Cincinnati Corrugating Co., Piqua, O.
Johns, H. W. Mfg. Co., 87 Maiden Lane

Rope and Web Goods.
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N.Y

Rope Wheels.
Cresson, Geo. V. Co., Philadelphia, Pa.

Rubber Goods.
Canfield, H. O., Bridgeport, Conn.

Rules. *Manufacturers of.*
Lufkin Rule Co., Saginaw, Mich.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers,

Sad Irons.
Universal Sad Iron Co., Milwaukee, Wis

Sand Paper.
Baeder, Adamson & Co., Phila., Pa.

Sash Balances.
Caldwell Mfg. Co., Rochester, N. Y.
Pullman Sash Balance Co., Rochester, N. Y.
Stewart & Baker, Rochester, N. Y.
Vanderbilt Sash Balance Co., Canandaigua, N. Y.

Sash Cords and Chains.
Morton, Thos., 65 Elizabeth, N. Y.
Ossawan Mills Co., Norwich, Conn.
Samson Cordage Works, Boston, Mass.
Smith & Egge, Mfg. Co., Bridgeport.
Cincinnati Corrugating Co., Piqua, O.

Sash Locks.
Ives, H. B. & Co., New Haven, Conn.

Sash Pulleys.
Empire Portable Forge Co., Lansingburgh, N. Y.
Palmer Hardware Mfg. Co., Troy, N. Y

Sash Pulley Marker.
Skelly J. W. & Son, Bristol, Conn.

Sash Weights.
Brown, E. E. & Co., Philadelphia, Pa.

Sash Weight Fasteners.
Skelly, J. W. & Son, Bristol, Conn.

Saws, *Makers of.*
Disston, Henry & Sons, Phila., Pa.
Hiles, C. A. & Co., 336-338 Carroll Ave Chicago, Ill.
National Saw Co., 96 Reade St., N. Y.
Simonds Mfg Co., Fitchburg, Mass.

Saw Handles.
Gwinner Mfg. Co., Hamilton, O.

Saw Sets.
Kohler, F. E. & Co., Canton, Ohio.
Taintor Mfg. Co., 84-86 Chambers, N.Y.

Scales, *Manufacturers of.*
Buffalo Scale Co., Buffalo, N. Y.
Chatillon, John & Sons, 85-89 Cliff, N.Y

Scrapers, Road.
Am. Steel Scraper Co., Sidney, Ohio.
Kilbourne & Jacobs Mfg. Co., Columbus, O.
Sidney Steel Scraper Co., Sidney, O.

Screens, Door and Window.
Queen Anne Screen Co., Burlington Vt.

Screw Cutting Machinery.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Screw Drivers.
Brown, R. H. & Co., New Haven, Conn.
Capitol Mfg. Co., Chicago, Ill.
Chantrell Tool Co., Reading, Pa.
Gay & Parsons, Augusta, Me.
Mayhew, H. H. Co., Shelburne Falls, Mass.

Screw Plate and Pipe Cutter.
Jarecki Mfg. Co., Erie, Pa.

Screws, *Makers of.*
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Wm. H. Haskell Co., Pawtucket.
Miles, C. S., 205 Quarry, Philadelphia.
National Screw & Tack Co., Cleveland, Ohio.
Reynolds & Co., New Haven, Conn.
Worcester Machine Screw Co., Worcester, Mass.

Scroll Saws.
Barnes, W. F. & John, Rockford, Ill.
Seneca Falls Mfg. Co., Seneca Falls N.Y

Scythe Stones and Whetstones.
Pike Mfg. Co., Pike Stat'n, N. H.
Cleveland Stone Co., Cleveland, O.

Shafting, *Makers of.*
Cresson, Geo. V., Co., Philadelphia, Pa.
Fairmount Mch. Co., Philadelphia, Pa.
Fitzsimons & Co., Cleveland, Ohio.
Sellers, Wm. & Co., Inc. Phila. Pa.
Stow Mfg. Co., Binghamton, N. Y.

Shaped Iron and Steel,—*Manufacturers of.*
Ætna-Standard Iron & Steel Co. Bridgeport, O.

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Allentown Rolling Mill, Allentown, Pa
Illinois Steel Co., Chicago, Ill.
Lockhart Iron & Steel Co., Pittsburg, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville Pa
Roberts, A. & P. & Co., Phila., Pa.
The Phœnix Iron Co., Phila., Pa.
Tudor Iron Works, St. Louis, Mo.

Shears and Scissors.
Acme Shear Co., Bridgeport, Conn
Heinischs, R. Sons Co., Newark, N. J.

Sheet Iron and Steel, *Manufacturers of.*
Ætna-Standard Iron and Steel Co., Bridgeport O.
Cambridge Iron & Steel Co., Cambridge Ohio.
Chess Bros., Pittsburgh, Pa.
Mahoning Valley Iron Co., Livingston, Ohio.
Moorehead-McCleane Co., Pittsburgh,
Pierson & Co., 29 Broadway, N. Y
Reily, John W., Fort Hunter P.O., Pa.
Singer, Nimick & Co., Ld., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia.
W. Dewees Wood Co., McKeesport, Pa.

Sheet Metal Work.
Clark & Cowles, Plainville, Conn.

Sheet Zinc.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Shelf Brackets.
Koch, A. B. & Co., Peoria, Ill.

Shipping Blanks.
Barlow Bros., Grand Rapids, Mich.

Shovels, Spades and Scoops.
Myers, H. M. Co., Beaver Falls, Pa.

Shutter Workers.
Tyson & Zimmerman, Frederick, Md.

Sinks.
Douglas, W. & B., Middletown Conn.

Skates, Ice.
Dame, Stoddard & Kendall, Boston, Mass.
Winslow, Sam'l, Skate Mfg. Co. Worcester, Mass.

Skates, Roller.
Henley, M. C., Richmond, Ind.
Union Hardware Co., Torrington, Conn
Winslow, Saml., Skate Mfg. Co., Worcester, Mass

Smelting Works.
Reeves, Paul S., 760 S. Broad, Phila.

Speaking Tubes.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.

Specialties, Pat. Articles.
Konigslow, O., Cleveland, O.

Speed Indicators.
Church & Sleight, 109 Fulton St., N. Y.

Spelter.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Spoons and Forks.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.

Sporting Goods.
Hartley & Graham, 313-315 B'way, N.Y

Springs.
American Spiral Spring Co., Pittsburgh, Pa.
Cary, Alanson, 240-242 W. 29th St., N.Y
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y
Morgan Spring Co., Worcester, Mass
Nourse, Fred. Co., 315 to 319 E. 22d St., N. Y.
Sabin Machine Co., Montpelier, Vt
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.

Spring Hinges.
Bardsley, J., 149 & 151 Baxter St., N.Y.
Chicago Spring Butt Co. Chicago, Ill.
Pullman Sash Balance Co., Rochester N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Co., 14 Warren St., N. Y.

Spring Keys and Cotters.
Whitman & Barnes Mfg. Co., Syracuse N. Y.

Sprinklers.
Smith, Oliver A., Clarkston, Mich.

Stamped Ware.
Am. Stamping Co., 104 & 106 John St. New York

Stamping Works.
Avery Stamping Co., Cleveland, O.
Cleveland Stamping & Tool Co., Cleveland, O.

Staples.
Cobb & Drew, Plymouth, Mass.
Titchener E. H. & Co. Binghamton N.Y

Steam Gauges.
Ashcroft Mfg. Co., 111 Liberty St., N.Y
Bristols Mfg. Co., Waterbury, Conn.

Steam Hammers, &c., *Makers of*
Dienelt & Eisenhardt, Philadelphia.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Trethewey Mfg. Co., Pittsburgh, Pa.

Steam Heating.
Webster Warren & Co., Camden, N.J.

Steam Separators.
Goubert Mfg. Co., 32 Cortland St N. Y.
Harrison Safety Boiler Wks. Phila. Pa

Steel Balls.
Grant Anti-Friction Ball Co., Fitchburg, Mass.

Steel, Cold Rolled Strip.
Wilmot & Hobbs Mfg. Co., Bridgeport Conn.

Steel Figures and Alphabets.
Krogerud, W., 61 Fulton, N. Y.

Steel Importers.
Abbott, Jere & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 88 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y
Whitney, A. R. & Co., B'dway, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

Steel (Mushet's Special).
Jones, B. M. & Co., Boston.

Steel Manufacturers.
Ætna-Standard Iron & Steel Co., Bridgeport.
Bethlehem Iron Co., S. Bethlehem, Pa
Boker, Hermnan & Co., 103 Duane St.
Carbon Steel Co., Pittsburgh, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Eiken & Co., Hagen, Germany.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Illinois Steel Co., Chicago, Ill.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorhead-McCleane Co., Pittsburg Pa
Moss, F. W., 83 John N. Y
Naylor & Co., 45 Wall, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Reily, J. W., Fort Hunter P. O., Pa.
Rowland, Wm. & Harvey, Frankford Philadelphia.
Singer, Nimick & Co., Pittsburgh.
Stanley Works, New Britain, Conn.
Steel & Iron Improvement Co., Pittsburgh, Pa.
Taylor Iron & Steel Co. High Bridge, N.J
Wordlaw, S. & C., Sheffield, Eng
Wetherell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport Conn

Steel, *Manufacturers' Agents.*
Barnes, C. K. & Co., Philadelphia, Pa
Corning, Edw, & Co., 29 B'way, N. Y.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.

Steel Rails, *Manufacturers of.*
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Illinois Steel Co., Chicago, Ill.
Montour Iron & Steel Co., Danville Pa
Riverside Iron Wks., Wheeling, W.Va

Steel Spiral Springs, *Manufrs,*
Roland, Wm. & Harvey, Frankford.
Wolff, R. H. & Co., Ltd., 118 Street and Harlem River, N. Y.

Steel, Tool.
Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.

Step Ladders.
Bicycle Step Ladder Co., Chicago, Ill
Croissant, M., Albany, N. Y.

Stocks and Dies.
Armstrong Mfg. Co., Bridgeport, Conn
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Saunder's Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield Mass.

Stove Linings.
Ostrander Fire Brick Co., Troy, N. Y

Stove Pipe Thimbles.
Cheney, S. & Son, Manlius, N. Y

Stove Trimmings.
Troy Nickel Works, Troy, N. Y.

Street Lamps.
Dietz, R. E., Co., 60 Laight St., N. Y.
Steam Gauge & Lantern Co., Syracuse N. Y.

Strops.
Electric Cutlery Co. 113 Chambers, N.Y
J. R. Torrey & Co., Worcester, Mass.

Stropping Machines.
Schmitz, E. Lothar, 92 Reade St., N. Y.

Structural Iron Work.
Berlin Iron Bridge Co., East Berlin, Conn.
Boston Bridge Wks., Boston, Mass.
Lindsay, Jas. G. & Co., Phila., Pa.
Wrought Iron Bridge Co., Canton, O.

Sulphuric Acid.
Matthiessen & Hegeler Zinc Co. La Salle, Ill.

Tacks, Brads, Staples, &c.
Atlas Tack Corporation, Boston, Mass
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Nat. Screw & Tack Co., Cleveland O.
Phillips, E. & Sons, South Hanover.
Plymouth Mills, Plymouth, Mass.
Trafant, W. E., Whitman, Mass.

Taps and Dies.
Butterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty, St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Testing Laboratories.
Riehle Bros. Testing Mch. Co., Philadelphia.

Testing Machines.
Riehle Bros. Testing Mch. Co., Phila.

Theatrical Hardware.
Wollensak, J. F., Chicago, Ill.

Thill Springs.
Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.

Time Record.
Scattergood, H. W., Phila., Pa.

Tinners' Hardware.
Berger Bros., Philadelphia, Pa.

Tin Plate Machinery.
Lloyd Booth Co., Youngtown, Ohio.

Tinware.
Am. Stamping Co., 104 & 106 John St.,
Matthai, Ingram & Co., Baltimore, Md.

Tire Upsetters.
Butts & Ordway, Boston, Mass,
Illinois Iron & Bolt Co., Carpentersville, Ill.

Toe Calks, Steel.
Burke, P. F., Boston, Mass.

Tool Chests.
Am. Tool Co., 200 W. Houston St., N.Y.

Tools.
Britton, Horace E., Stoughton, Mass.
Brown, R. H. & Co., New Haven, Conn.
Chantrell Tool Co., Reading, Pa.
Cincinnati Tool Co., Cincinnati, O.
Frasse Co., 19 Warren St., New York.
Fray, Jno. S. & Co., Bridgeport, Conn.
Mayhew, H. H. Co., Shelburne Falls, Mass.
Millers Falls Co., 93 Reade, N. Y.
Richardson, C. F. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers,
Starrett, L. S., Athol, Mass.
Tower & Lyon, 95 Chambers St., N. Y.

Tools, Blacksmith and Wheelwrights.
Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Illinois Iron & Bolt Co., Carpenterville, Ill.
Plumb, Fayette R. Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Tools, Steam and Gas Fitters'
Saunders' Sons, D., Yonkers, N. Y.

Torches, Oil and Gasolene.
Dangler Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.

Transom Lifters.
Wollensak, J. F. Chicago, Ill.

Tree Protectors.
McCallip Fence & Wire Wks., Columbus, Ohio.

Trucks, *Manufacturers of.*
Berger Bros., Philadelphia, Pa.
Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.
Clark, G. P., Windsor Locks, Conn.
Lansing Wheelbarrow Co. Lansing Mich.

Tubes, Seamless Drawn Copper.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y
Randolph & Clowes, Waterbury, Conn.

Tubes, Steel.
Lang's John S. Son & Co., 4 Fletcher St., New York.
Mannesmann Tube Co. Ltd, Landore, England.
Shelby Steel Tube Co., Shelby, O.

Tumbling Barrels.
Henderson Bros., Waterbury, Conn.

Turnbuckles.
Central Iron & Steel Co., Brazil, Ind.
Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.

Twist Drills. *Makers of.*
Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.

Valves, Gas, Water and Steam.
Best, Fox & Co., Pittsburgh, Pa.
Chapman Valve Mfg. Co., Boston.
Jenkins Bros., 71 John, N. Y.
McNab & Harlin Mfg. Co., 56 John N. Y.
Mason Regulator Co., Boston, Mass.

Ventilating Fans.
Huyett & Smith Mfg. Co., Detroit, Mich.

Ventilator Appliances.
Howard & Morse, 45 Fulton, N. Y.

Vise Jaws.
Newark Mch. Tool Co., Newark, N. J.

Vises.
Hollands Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y
Interchangeable Tool Co. Boonton, N.J
Millers Falls Co., 93 Reade St., N. Y.
Prentiss Vise Co., 44 Barclay N. Y.
Tower & Lyon, 95 Chambers St., N. Y.
Van Wagoner & Williams Co., 14 Warren St., N. Y.

Wagon Jacks.
Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y

Washers.
Haskell, Wm. H. Co., Pawtucket, R. I.
Milton Mfg. Co., Milton, Pa.
Sternbergh, J. H. & Son, Reading, Pa.

Washing Machines.
Huenefeld, E. H., Cincinnati, Ohio.
Neff, W. H., Cowan, Ind.
Olds Wagon Works Ft. Wayne, Ind.
Stearns Mfg. Co., Connersville, Ind.
Wayne, A. Mfg. Co., Ft. Wayne, Ind.

Water Meters.
Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Water Wheels.
Poole, Robt. & Son Co., Baltimore, Md.

Well Machinery.
Amer. Well Works, Aurora, Ill.

Wheels.
Arnold Metal Wheel Co., New London, O.

Wheelbarrows.
Akron Tool Co., Akron, O.
Amer. Steel Scraper Co., Sidney, Ohio.
Cockburn Barrow & Mch. Co., Jersey City, N. J.
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
Lansing Wheelbarrow Co., Lansing, Mich.
Sidney Steel Scraper Co., Sidney, O.
Sweatt Mfg. Co., Minneapolis, Minn.
Toledo Wheelbarrow Wks., Toledo, O

Whips.
American Whip Co., Westfield, Mass.

Window Cord, *Makers of.*
Samson Cordage Works, Boston, Mass

Wire, *Manufacturers of.*
Amer. Spiral Spring Co., Pittsburg, Pa
Consolidated Steel & Wire Co., St. Louis, Mo.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Miller & Van Winkle, Brooklyn, N. Y.
New Castle Wire Nail Co., New Castle, Pa.
New Haven Wire Mfg. Co., New Haven, Conn.
Salem Wire Nail Co., Salem, O.
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester
Wetherell Bros., 93 Liberty St., N. Y.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
Wright & Colton Wire Cloth Co. Worcester, Mass

Wire Cloth.
Barnum, E. T., Detroit, Mich.
Clinton Wire Cloth Co., Clinton, Mass.
Darby, Edward & Sons, Philadelphia.
Estey, W. S., 65 Fulton, N. Y.
Gilbert & Bennett Mfg. Co., 42 Cliff.
Howard & Morse, 45 Fulton, N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
Reliance Wire & Iron Wks. Milwaukee Wis.
Scheeler & Sons, Buffalo, N. Y.
Wickwire Bros., Cortland, N. Y.
Wright & Colton Wire Cloth Co., Worcester, Mass.
W. S. Tyler Wire Works Co., Cleve'd.

Wire Cutters.
Cronk Hanger Co., Elmira, N. Y.
Higganum Hdw. Co. Higganum, Conn.
Interchangeable Tool Co. Boonton, N.J
King, J. M. & Co., Watertown, N. Y.

Wire Dies.
McFarland, Wm., Trenton, N. J.
Newton & Shipman, 88 John, N. Y.

Wire Door Mats.
Hartman Mfg. Co., Elwood City, Pa.
White Mfg. Co., Minneapolis, Minn.
The Wire Goods Co., Worcester, Mass.

Wire Fences.—*See Fencing, Iron and Wire.*

Wire Goods, *Manufacturers of.*
Darby, Edward & Sons, Phila.
Gilber & Bennett Mfg. Co., 42 Cliff St., N. Y.
Lange Fence & Wire Co., St. Louis, Mo.
Ludlow-Saylor Wire Co., St. Louis.
Ossawan Mills Co., Norwich, Conn.
Scheeler & Sons, Buffalo, N. Y.
Whitman & Barnes Mfg. Co., Syracuse, N. Y.
Wire Goods Co., Worcester, Mass.
Wickwire Bros. Cortland, N. Y.
Williamson, C. T. Wire Novelty Co. Newark, N. J.

Wire Machinery.
Am. Tool Wks., Cleveland, O.
Manville, E. J. Mch. Co., Waterbury, Ct.
Morgan Construction Co., Worcester Mass.
Waterbury Mch. Co., Waterbury, Conn

Wire Straightening and Cutting Machinery.
Adt, John & Son, New Haven, Conn.

Wire Nails.
Consolidated Steel & Wire Co., St. Louis, Mo.
Indiana Wire Fence Co., Crawfordsville, Ind.
Kilmer Mfg. Co., Newburg, N. Y.
New Castle Wire Nail Co., New Castle Pa.
Phillips, E. & Sons, South Hanover Mass
Phillips, Townsend & Co., Phil., Pa.
Plymouth Mills, Plymouth, Mass.
Salem Wire Nail Co., Salem, O.
Taunton Wire Nail Co., Taunton, Mass
Whitney, A. R. & Co., New York Ct.

Wire Rods, Steel.
Consolidated Steel & Wire Co., St. Louis, Mo.
Illinois Steel Co., Chicago, Ill.
New Castle Wire Nail Co., New Castle Pa.
Washburn & Moen Mfg. Co., Worcester, Mass.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

Wire Rope, Iron and Steel *Makers.*
Broderick & Bascom Rope Co., St. Louis, Mo.
California Wire Works, San Francisco
Hazard Mfg. Co., Wilkesbarre, Pa.
A. Leschen & Sons Rope Co., St. Louis
Trenton Iron Co., Trenton, N. J.
Washburn & Moen Mfg. Co., Worcester Mass.
Williamsport Wire Rope Co., Williamsport, Pa.

Wire Spool.
Malin & Co., Cleveland, O.

Woodenware.
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Wood-Working Machinery.
Seneca Falls Mfg. Co., Seneca Falls, N.Y.

Wrapping Paper
Am. Roll Paper Co., St. Louis, Mo.

Wrenches, *Manufacturers of.*
Bemis & Call Hardware & Tool Co, Springfield, Mass.
Billings, Spencer & Co., Hartford, Conn
Capitol Mfg. Co., Chicago, Ills.
Central Iron & Steel Co., Brazil, Ind.
Coes Wrench Co., Worcester, Mass
Gendron Iron Wheel Co., Toledo, O.
Keystone Mfg. Co., Buffalo, N. Y.
Portsmouth Wrench Co., Boston, Mass
Tower & Lyon, 95 Chambers St., N. Y
Trimont Mfg. Co., Roxbury, Mass.
Williams, J. H., Brooklyn, N. Y.

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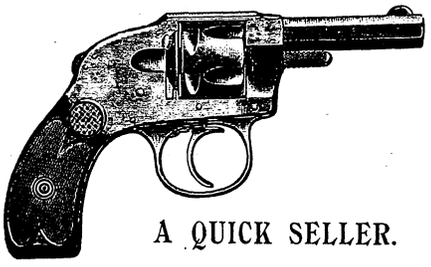

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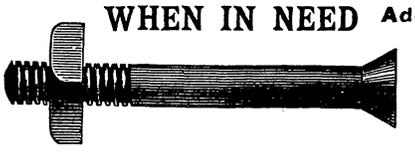

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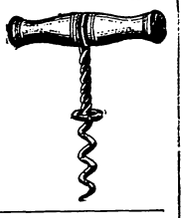

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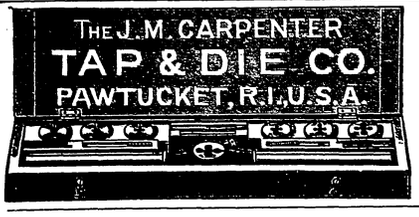

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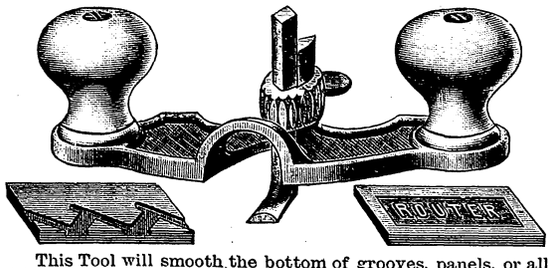

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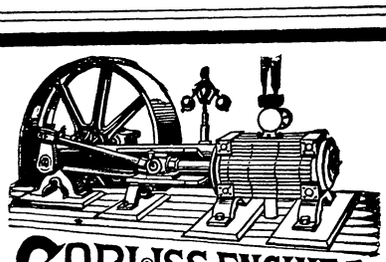

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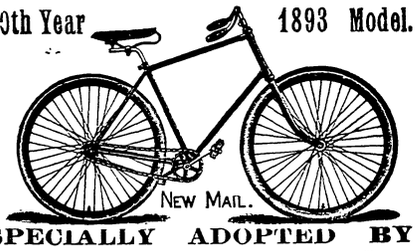

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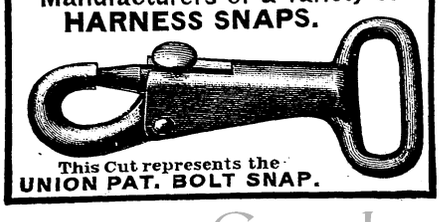

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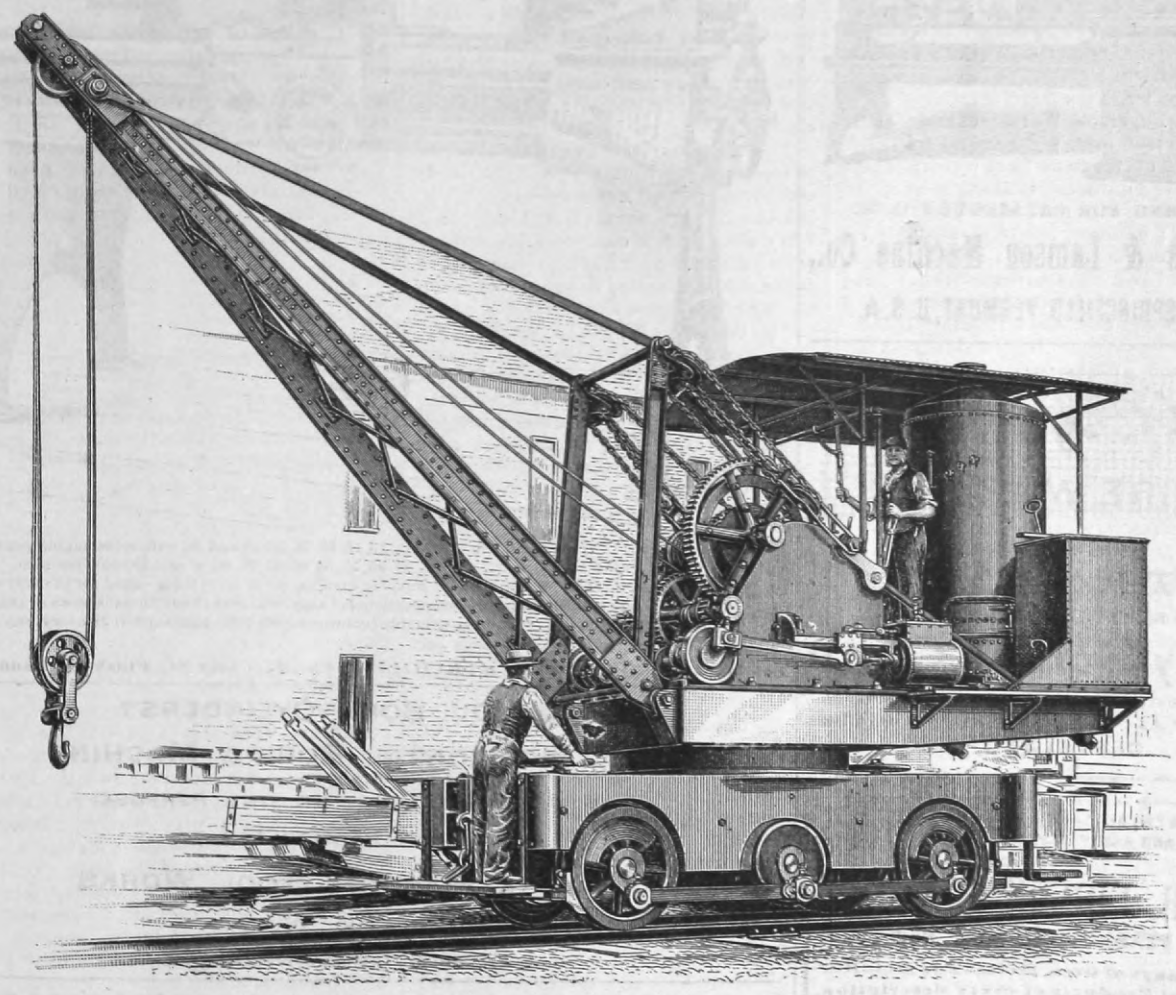
THE IRON AGE

THURSDAY, AUGUST 3, 1893.

The Halsey Ten-Ton Locomotive Crane.

The Allentown Rolling Mills have recently built a crane designed by W. S. Halsey of Allentown, Pa., which we illustrate in the accompanying engraving. It is a locomotive crane capable of lifting 10 tons at a radius 16 feet from the center of a 4-foot 8½-inch gauge track without clamping to the rails or blocking up under extension bars. It is so designed as to be able to adjust the radius of the jib with the load suspended from 12 feet radius to 23 feet radius, and is capable of rotation in either direction, and can travel along the track at the rate of ten miles per hour. The truck is constructed to give a flexible wheel base and the structure is carried on heavy locomotive springs. The driving wheels are of the locomotive type, with turned steel tires shrunk on and crank pins set on the quarter stroke. The four wheels are coupled together by side rods and driven by an auxiliary shaft and crank disks that run in adjustable bronze-metal boxes. The auxiliary shaft has a steel bevel gear keyed to it that engages with a bevel pinion, which is rotated by a vertical shaft passing through the center pin, which in turn receives its motion from a shaft lying horizontally and at right angle with the engine shaft, the motion being transmitted by bevel wheels. The machinery platform is held in position by a hammered steel pin and is supported by four rollers, which roll on a slewing rack. The latter, which is set loose on the truck, is so designed as to prevent the breaking of the rotating gearing in case a man reverses the direction of rotation too suddenly. The gearing will reverse, but the rack will slip. All the movements are independent of each other. The clutches are all tooth clutches excepting the rotating, which are friction clutches. The tooth clutches are automatic in their engaging and disengaging when the operating lever is set for its work. Both drums are provided with powerful band brakes. The engines are designed for 100 pounds steam pressure and have the reversible link motion. The boiler is of steel, hydraulic riveted, and tested to 150 pounds pressure. The coal bunker and water tank carry a supply sufficient for six hours' work. The machine is very heavy and will stand the roughest usage. All parts are in easy access and any piece can readily be detached. This machine was designed with the intention of being used as a shifting engine as well as for lifting purposes, coupling chains, platform steps and hand brakes being provided at each end of the truck.



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BY E. C. POTTER, CHICAGO.

IV.

The Swedes have chosen to assemble their iron and steel exhibits in their own Government Building, and a magnificent display they make; in fact, second only to the display of Germany. The Swedish ironmasters pride themselves not so much upon the size and extent of their plants as upon the high quality and general excellence of their product. The raw materials at their command enable them to accomplish this, as their pig iron is all made with charcoal fuel and their ores are singularly pure. The product, therefore, is very low in those very deleterious elements, sulphur and phosphorus. The Swedish works are all rather small when measured by an American standard, but this fact is not made manifest when comparing the American exhibits with the Swedish. Indeed, the Americans have much to learn and can profit greatly by a careful study of the iron and steel display in the Swedish Building. With one or two exceptions the Swedish works make their exhibits collectively under the supervision of the

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Jernkontoret, or Association of Swedish Ironmasters. The wisdom of this arrangement is understood when one perceives that the display of each works taken alone would be small and insignificant, while the united display permits of a massing and arrangement which is most striking and effective, and at the same time magnifying the resources of this country in this particular industry. Fifteen works are thus represented.

Sandvik, one of the most noted of the Swedish works, has a small, but characteristic display, consisting: 1, of the largest band saw in the world, being 220 feet long, 12 inches in width, No. 14 gauge in thickness and weighing 677 pounds; 2, the longest cold rolled band saw in the world, being 12 inches wide, No. 25 gauge in thickness and 650 feet long, weighing 528 pounds, and 3, the longest band of hot-rolled steel ever produced of its dimensions, which are: width, 12 inches; thickness, No. 6 gauge; length, 90 feet; weight, 771 pounds. In addition to these the Sandvik Works also show some car and locomotive tires, of which they are large manufacturers.

The Fagersta Works exhibit their various iron ores, pig iron and fractured sections of Siemens Martin steel. Their finished products consist mainly of steel bars, wire rod, wire and barbed fencing; hammer heads in all varieties and miscellaneous tools; coiled springs, many of which are made from a wire that does not require tempering, and their special and most interesting feature, hollow cast ingots for making tubes and gun barrels.

The Finspong Gun Factory Company, Limited, operating the Finspong and Grytjol Works, exhibit their pig iron and rolled iron and steel bars, wire, wire netting and cloth, wire nails, cut nails and tacks, horse-shoe blanks, sledge-hammers, stone hammers, saws and edge tools, besides various sizes of conical projectiles for guns.

The Forsbacka Works display various pig irons and slags, Bessemer ingot fractures and billets; forged steel for tools and a line of finished tools made from their steel; a full set of tests of their steel for quality and tensile strength. A beautiful test, showing the remarkable qualities of this firm's material is that of a piece of steel originally $2\frac{5}{8}$ inches high and $2\frac{3}{16}$ inches in diameter hammered cold to a circular sheet 7 inches in diameter and $\frac{3}{16}$ inch thick, with the edges and surface perfectly smooth and intact.

The Horndal Works exhibit their special low phosphorus and sulphur pig iron, refined iron blooms made by the Lancashire charcoal fire process, billets for wire and horse nail rods, flat horse nail rods, in both bundles and coils, wire rods for finest drawn and best quality wire, all sizes of rivet rods for cold made rivets, and bar iron for making crucible steel with phosphorus guaranteed at 0.014 per cent. to 0.016 per cent. and sulphur guaranteed at 0.005 per cent. to 0.007 per cent. Their specialty is the manufacture of material of the highest quality and purity.

The Kilafors Works exhibit pig iron and bar iron of exceptional purity, made especially for export to England and Germany for the manufacture of crucible and blister steel. These works are devoted exclusively to these products, their pig iron fetching $25 per ton at the works and their bar iron $60. The Laxa Works are employed in much the same line and exhibit the same class of material.

The Degerfors Company, operating the Strömsnäs Works, show fractures of ingots and steel bars, samples of bar iron and sheet iron showing cold bend, coils of wire, hammers and stonemasons' tools and rolled pipes, of which there are some rather remarkable tests.

The Ankarsrum Works display examples of their ingots, blooms and billets of Siemens-Martin steel and those made by the Lancashire process, together with rolled bars of the same.

The Avesta Works, famous in the metallurgical world for their achievements with the small converter, show ingots and billets of Bessemer and open-hearth steel, rolled steel bars, round, square, octagonal and flat, many of them twisted and tied in all sorts of knots, showing the high quality of the metal.

The Bofors-Gullspang Company have a considerable display of pig iron and slags, open-hearth steel, bar iron and wire rods of refined Lancashire iron, drawn wire and wire rope, cast-steel goods, prominent among which are cast-steel car wheel centers after the Wanner system, a rather intricate and difficult casting to make; cast-steel gun trunnions and tubes, screw propellers and various sizes of conical projectiles for guns.

The Kohlswa Works exhibit their low phosphorus pig iron, wire and nail rods made from refined Lancashire iron, open-hearth nail plate for making horse nails. They also show a cast-steel locomotive wheel center, which has been bent out of shape by hydraulic pressure, showing the high quality of the metal.

The Söderfors Works have a large exhibit showing their iron ores, among which is some from the famous Dannemora district; pig iron for the Walloon, Lancashire and open-hearth processes as well as for export; fractures of steel ingots of varying degrees of hardness and fractures of billets, both rolled and hammered; fractures of blooms and of Walloon iron for crucible steel, various sizes of rolled and forged iron and steel bars, tools, files and railway springs of open-hearth steel, railway and tramway wheels, Wanner system; gear wheels, anchors, anvils and parts of steam engines and machinery made from open-hearth castings.

The Österby Works exhibit pig iron made exclusively from Dannemora ore and charcoal, bar iron made by the Walloon process, steel made by the cementation process, crucible steel in ingots, bars and wire, and various tools and tool blanks.

The Surahammar Works show railway axles, one of which, a locomotive driving axle made of puddle steel, is shown bent double cold after having run 765,000 km. A forged iron wheel center with Bessemer steel tire is also shown. The feature of this exhibit, however, is the display of steel milk separators for dairy use. These works enjoy a monopoly of this trade, as they are practically the only works in the world where these machines are made. They were invented by De Laval 15 years ago, since which time about 40,000 have been turned out. They are difficult things to make, being formed of heavy steel plate, and the shapes are most of them intricate. The necessity for strength in the material is apparent when one learns that these bowls are driven at a uniform rate of 7000 revolutions per minute, the cream being separated from the milk by the tremendous centrifugal force thus generated. The bowls are tested up to 10,000 revolutions per minute.

The most artistic display in the collection is that of the Uddeholm Works who exhibit independently of the Jernkontoret. It must be seen to be appreciated, as a description in cold type would be entirely inadequate. Suffice it to say that a large assortment of iron and steel in the shape of blooms and billets, bars and rods, cold rolled steel springs, horse nails, wire nails and screws, hammers, axes, picks, crowbars and anvils, are arranged in a most pleasing and effective manner and form one of the most striking displays in the Swedish building.

The Stora Kopparbergs Company, operating the Domnarfvet Works, are the largest iron and steel works in Sweden, and probably the largest steel works in the world operating wholly on charcoal iron. In addition to their iron works they are the fortunate proprietors of the only copper mine in Sweden, a mine of great antiquity, as copper was definitely known to have been obtained from it as early as the year 1228. During the 700 years the mine has been worked it has produced copper to the amount of $185,000,000 in value. The company, further, own vast tracts of forests, from which their charcoal is produced, and which also yield lumber to the amount of 90,000,000 feet annually. Their forest domain embraces nearly three quarters of a million acres. Their annual capacity in their iron and steel department is as follows:

	Tons.
Charcoal pig iron	52,000
Bessemer ingots	25,000
Open-hearth ingots	26,000
Charcoal blooms	7,000
Rolled and hammered iron and steel	47,000
Horse nails	600

In addition to these their manufactured products include the sulphates of iron and copper and red mineral paint. The copper mine yields annually 15,000 tons of ore and 500 tons of ingots. These works are operated wholly by water-power, derived from the River Dala. These are the only works in Sweden, judging from the exhibits, that undertake the manufacture of the heavier lines of material, such as steel rails, shapes, &c. Their exhibit includes nail, wire and rivet rods of Bessemer open-hearth and Lancashire metal; Bessemer and open-hearth ingots, blooms, billets, slabs and bars; rough, hammered and rolled Lancashire bars; various sections of standard steel rails, angles, tees and other shapes; boiler and ship plates and sheets; pressed and flanged plates; corrugated sheets; cold-rolled steel shafting; hammered steel for tools, springs, files, &c.; horse shoe nails; stone-cutting tools, hammers, anvils, &c., together with numerous tests for quality and tensile strength.

In connection with the iron and steel exhibits is shown a very interesting model of an apparatus invented by J. L. Sebenius of Nykroppa, which has for its object the elimination of blowholes in the casting of steel, a consummation that would win for him the undying gratitude of all steel makers. The apparatus consists of a central pillar, from which project four horizontal arms, the pillar being connected with rotating machinery at its base. At the extremity of each arm is hung a group of four ingot molds, each mold being suspended upon trunnions situated about one third its hight from the top. The steel being poured into the molds, while still molten the central pillar to which is attached the arms is rotated at a considerable speed. The centrifugal force thus generated causes each mold to tilt upon its trunnions and tends to bring the occluded gases toward the surface. The apparatus is

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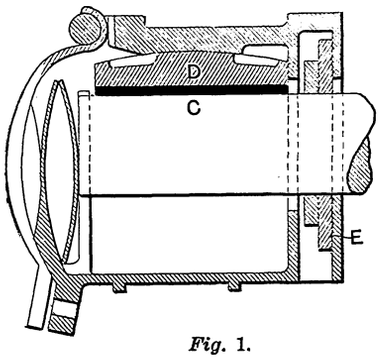
still in the experimental stage at the Nykroppa Works. The outcome will be watched with interest.

The impression left upon the observer after an examination of the Swedish iron and steel exhibit is that of painstaking care both in the exhibits themselves and in the conduct of their works, their processes and products. One experiences as much satisfaction in looking at iron and steel products of high quality and purity as in looking at a thoroughbred animal or an art work of the old masters. Each is the best of its kind, and in this regard the Swedish products of iron and steel still maintain their pre-eminence throughout the world. Comparing the Swedish processes with the American we find our chief recommendation to be rapid and enormous production. If the American exhibitors would attach to their pig iron exhibits a card stating that "this iron is turned out of our furnaces at the rate of 2500 tons per week per furnace," or to each exhibit of rails, "these rails are made at the rate of 2000 tons per day," our exhibits might attract some attention. Or if the Americans had taken the pains to show drawings and models of their really wonderful furnaces, machinery and plants in general they would have played their strongest card and put themselves beyond all chance of competition from foreign works. But for the Americans to pit themselves against the Swedes and Germans with the kind of displays they make at the World's Fair and to submit themselves to the judgment of the world on that basis, is to confess this country as third rate in iron and steel manufacture. To use a very slang but very appropriate phrase, we are "not in it."

The Carboid Bearing.

Killingworth W. Hedges, an English engineer who has recently visited this country, is the inventor of a new bearing, which is being used extensively in England, where it is made by the Carboid Oilless Bearing Company of 7 Carteret street, Westminster, London. We understand that trials are to be made at an early date on the Broadway cable road and the Brooklyn Bridge.



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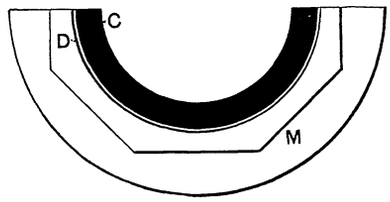

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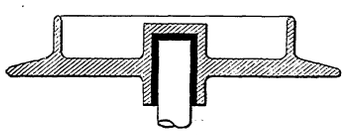
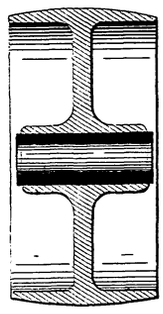


Fig. 2.



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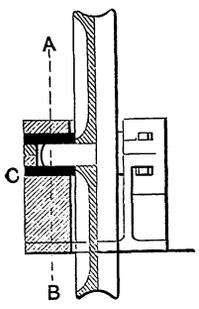

Fig. 3.

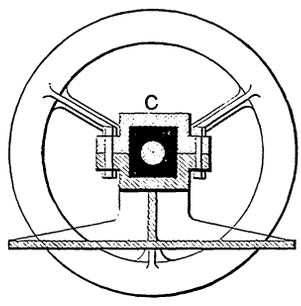

Fig. 4.—*Section A B Fig.* 3.

THE CARBOID BEARING.

The bearings are formed of plumbago or graphite, mixed with a certain proportion of steatite, the object being to harden the soft plumbago so that it can be molded either into the shape of an ordinary brass or into cylinders, which can be turned or worked to fit any desired bearing. The mixture, which is compressed by a hydraulic press and afterward baked, is slightly heavier than ordinary carbon, but much tougher, and is capable of being used where there are violent shocks, such as for lining the axle-box brasses of railway cars and other light rolling stock. Shafting has been running in these bearings over two years, the wear being very slight. The small bearings of the guide pulleys of the Edinburgh cable road, which are fixed under the roadway, have only worn $\frac{1}{32}$ inch, as a maximum in four months, whereas the lignum vitæ bearings, which they replaced, seldom lasted longer than that period without being renewed. The co-efficient of friction of a dry bearing, working under the best conditions, is not of necessity higher than a lubricated one, as used in ordinary circumstances; but, even allowing that it is, according to Professor Unwin, "the advantages of doing away with oiled bearings are so great that we could well afford some loss of power." Another advantage which is claimed for dry bearings is that the co-efficient of friction is practically constant, and the friction can be allowed for in designing the prime mover, whereas the friction in a lubricated bearing varies according to the quality of the lubricant and the attention paid to oiling.

Fig. 1 is a section of a car axle box, the carboid liner C being cemented by a special process to a worn axle brass, D, and a leather washer, E, may be used to keep out dirt, although this is not absolutely necessary, as experience in collieries, and also with the pulleys used on cable lines, shows that the material is not greatly affected by dust and dirt, and even grit has a tendency to imbed itself. Two cars fitted in this way will shortly be running on one of the London roads. Figs. 3 and 4 illustrate a special guide pulley designed by W. N. Colam for use on the Edinburgh cable roads. The carboid C is molded in the form of a square block projecting on one side so as to lubricate the side of the pulley. Fig. 2 is a horizontal pulley used for guiding the cable round curves, the carboid replacing the white metal liner, which had to be renewed every three months. Another important application of this oilless material is for the bearings of machinery used in the manufacture of explosives. In some processes, notably in the manufacture of dynamite, the machinery is left working without attention, and hitherto the limit of time has been to a great extent curtailed by the necessity of oiling, which is entirely obviated by the use of carboid. The Nobel's Explosives Company, Limited, use it extensively.

For applying carboid to bearings already in use it is bored out to allow a thickness of $\frac{1}{4}$ inch of carboid, C, Fig. 5. It is then cemented to the metal M by a special process. Fig. 6 shows a section of a solid loose pulley lined with a carboid bush, which is supplied about $\frac{1}{32}$ inch larger than the bore and inserted by means of a bolt and washer, the edges of the casting cutting away the carboid and insuring a good fit. A split pulley can be lined quite as simply, the carboid bush being, of course, in halves. In some machines there is considerable friction on the edge of the boss of the loose pulley. For instance, in the Keighley cutting machine, in which the belt may be thrown off and on 20 times per minute. To obviate the wear at, say, 750 revolutions, on the thin end of the bush a loose washer of carboid is inserted, which can be renewed if required without removing the fixed pulley.

At the Exposition of Progress to be opened at the Palace of Industry in Paris, the end of this month, some interesting practical illustrations will be given of the conversion of the energy of alternating electric currents into mechanical power. A general distribution of electrical power will be made through the building and put at the disposal of exhibitors. The current is to be produced at Levallois-Perret, four miles away, and it will supply power for running the machines, working elevators and ventilating fans, lighting the entire building, heating it, and doing all the cooking required.

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The Thompson Engine.

Among the engines exhibited at the World's Fair is one which has been known for some time on the Pacific coast, but is a newcomer in other parts of the country. One of the engines has been used for some time at the works of the Pacific Rolling Mill Company, San Francisco, and there has just been completed by the Golden State and Miners' Iron Works of San Francisco, the builders, a tandem compound 21 x 32 x 42 inch engine for the Salt Lake & Ogden Electric Company. The engine at the World's Fair is a 12 x 22 x 30 inch tandem compound, driving two lines of shafting in Machinery Hall.

The engine is the invention of I. F. Thompson of San Francisco, whose aim has been to retain the merits of the ordinary Corliss type and avoid its defects, the assumption being that the Corliss gear is the most economical and that the plain slide valve is more desirable than other types. We present n the accompanying illustrations a plain engine of the Thomson type. In the case of the tandem compound, the second cylinder is built on the same plan, and the additional movement is affected by the same eccentric without an additional joint. In Fig. 2 the details of the construction of the valve movement are shown and its operation may be studied from it.

There is one steam chamber with steam port and plain flat slide valve, S, at each end moving on a horizontal plane, and two exhaust chambers with plain flat slide valve, P, to each. The valve rod A is continued from the eccentric rod through the two exhaust chambers, and the valves P, each on its seat, are fastened to the rod and are moved regularly by the motion of the eccentric. An arm or hand, B, with steel face, is fastened to this exhaust rod at each end just outside the chamber. The steam valve rods F, which pass in through the end of the steam chamber, and to which the steam valves S are fastened, have each a knee trigger, C, pivoted in them. The steel faces of the hand on the exhaust rod coming in contact alternately with the steel faces of the knee trigger push the valves each in turn off its port, M, until steam enough enters to do the work of that stroke. Then the wedge or inclined plane D, adjusted by the governor, raises the trigger out of contact with the arm on the exhaust rod and the steam valve is thrown over its port by the pressure of steam within the steam chamber upon the area of the steam valve rod. The steam valve rods have each a dash pot, J, at the end, with air cushion, to arrest the momentum when the valve and rod are thrown.

The wedge or inclined plane D being set so as to trip the trigger when the engine is running with a normal load, at normal speed and with normal steam pressure, every change of load or of speed or of steam pressure is followed by a change of the position of the inclined plane backward or forward to correspond. Should there come an added load or a decrease of steam pressure the governor draws the wedge back, allowing the valve to move that much farther off the port and more steam to enter, and *vice versa*. All four valves are moved by one eccentric and with but one joint between the eccentric and the valves, the one at the sliding block that transmutes the rotary movement of the eccentric into the horizontal movement of the exhaust rod A.

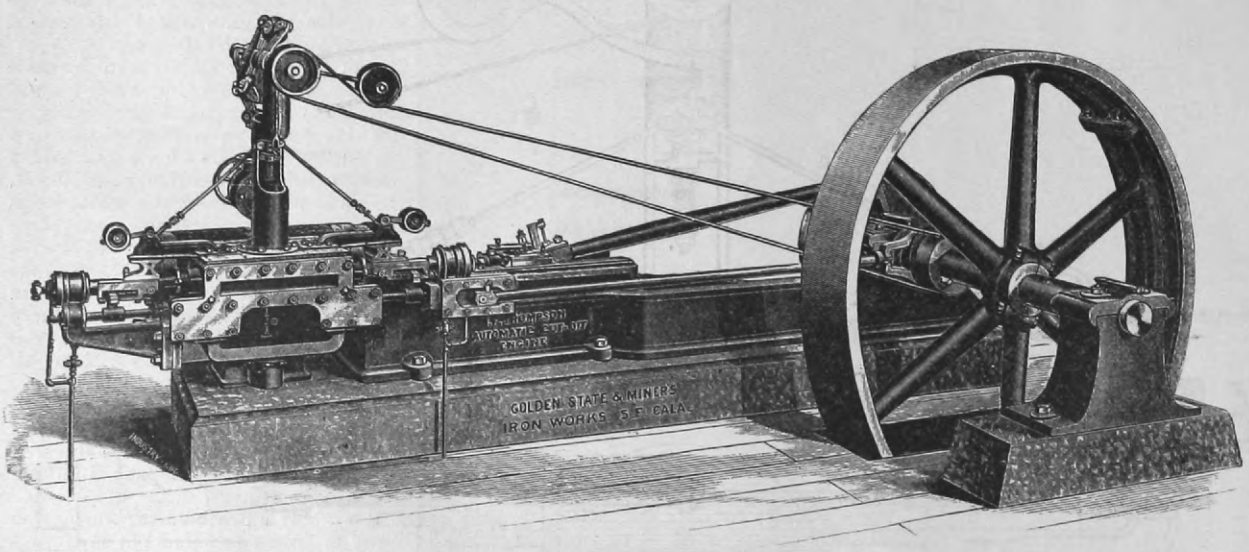

Fig. 1.—THE THOMPSON SLIDE VALVE CORLISS ENGINE.

From the Government torpedo station at Tiverton, R. I., come reports of the success of trials which are being made there of the Howell torpedoes, under the direction of the Naval Ordnance Department. Improvements have been effected in the weapon which have greatly increased its accuracy, and many torpedo experts are of the opinion that the Howell torpedo is now an even more efficient weapon than its rival, the Whitehead. It is rumored that the Ericcson submarine gunboat "Destroyer" is to be sent to Newport to take part in the trials.

Material progress is being made in the 8-inch Haskell multi-charge gun now being constructed at the Scott Foundry, Reading, Pa., for the War Department. The gun is built of five large longitudinal sections. All five parts have been united and screwed and shrunken together, the gun being now of its full length, 36 feet. The work of finishing and shrinking on the hoops is now being pushed forward rapidly. Projectiles weighing from 500 to 600 pounds will be used, with powder charges of 300 pounds.

Review of American Blast Furnace Practice.*

BY E. C. POTTER, CHICAGO, ILL.

It is not the purpose of this paper to enter into the minutiæ of a subject so vast, upon which volumes have already been written and volumes more might still be written, but simply to pass in review the characteristic features of that practice, which, dating from the blowing in of the Edgar Thomson A furnace in 1879 and continuing down to the present day, has given to American blast-furnace operations a new significance. The blowing in of A furnace marked the beginning of a new era in the science of iron smelting, if, indeed, it was not the very birth of science as applied to this industry in the United States. American blast furnace practice, in its generic sense and world-wide significance, dates from that day, and really all that is valuable, all that is remarkable or worthy of discussion, is embraced in the experiences and achievements of the past 15 years. Back of that we find only the dead level of mediocrity, or worse, a disposition to "let well enough alone;" a general, almost universal, employment of "rule of thumb" methods. The application of scientific principles and methods was rare and, indeed, previous to the introduction of the Bessemer process in the early seventies, science had no place in controlling the operations of the American blast furnace. The old practice consisted mainly in dumping raw materials in at the top of the furnace and tapping out iron and slag at the bottom, for the successful consummation of which the furnace manager directed his best energies toward keeping the furnace as free as possible from "gobbing," with, alas! but indifferent success. The burdening of the furnace was based largely on Mark Twain's receipt for "Johnny-cake," altered to suit the circumstances—viz., a lot of ore, a lot of fuel and about a quarter of a lot of flux. The possible capacities of furnace plants were not nearly realized. Enormous wastes were permitted, un-

* Read at the Chicago meeting of the American Institute of Mining Engineers' International Engineering Congress.

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heeded because not understood. In the use of fuel *quantum suff.* was always the rule. Increase of product was not thought of, because it was not deemed wise or safe to attempt anything beyond the rated or recorded capacity, and the furnace "seemed to be doing all it could, anyway." Generally speaking, the composition of the raw materials was but partially and imperfectly known, if known at all. A chemist, in most works, was unheard of.

The introduction of the Bessemer process was the first rude awakening of these easy-going furnacemen. They learned then, some of them for the first time, that there was such a thing as phosphorus. Sulphur was the one chemical element with which they already had some acquaintance, and their remedy for that was a full diet of fuel and lime—simple and efficacious, but how expensive they never knew. When pig iron was selling at from $40 to $50 per ton it did not much matter. With the recognition of phosphorus as an enemy, capable of spoiling a lot of otherwise good iron, the chemist appeared for the first time on the scene. Soon the Bessemer process introduced to the notice of the perplexed furnacemen another and most important factor—namely, silicon. In his effort to keep silicon within bounds he found sulphur asserting itself to his complete distraction. The chemist became more and more the manager's main-stay in his hour of trial. Soon the chemist himself was manager, and the new era had fairly dawned.

But it was not until 1879 that the features which now characterize the blast furnace practice of this country began to be developed. In that year the first of the now world-famous Edgar Thomson furnaces—furnace A—was erected and blown in. An account of this furnace and its work, by its builder and manager, Mr. Julian Kennedy, has been published (*Trans.*, viii, p. 348), and need not be repeated here. This was a small furnace—66 feet high by 13 feet bosh—yet how startled was the metallurgical world when it was known that this little furnace was yielding regularly 650 tons per week! Furnaces 30 per cent. larger were at that time yielding 350 to 400 tons per week, which was considered very satisfactory. This was also one of the first furnaces in this country to use the regenerative fire brick hot-blast stoves, which contributed in no small degree to its remarkable record. With furnace B of the same plant, blown in some months later, another giant stride forward was taken. Of much more ample dimensions than A, this furnace leaped into fame with a weekly product of 1200 tons, being the first furnace in the world to produce so large an amount. Furnaces C, D and E followed in rapid succession, each eclipsing its predecessor in output, until 1400 to 1500 tons per week came to be the regular thing, and the Edgar Thomson plant became the Mecca of furnace managers and owners from Europe as well as America. "American rapid driving" became a much-discussed question on both sides of the Atlantic, the serious and decisive objection found by our European friends being the great waste of fuel. Of this there could be no denial. The consumption of fuel in American blast furnaces had always been much greater than in those of Europe, and the rapid driving certainly had not decreased it. The Europeans were well content with their small outputs so long as their fuel consumption was relatively low, yet the Americans, having once tasted the glory and profit of rapid driving, were not willing to retrograde in this particular. Thus matters stood until 1885, during which year experiments looking to better economy in fuel consumption were instituted at the South Chicago furnaces of the North Chicago Rolling Mill Company. The previous history of these furnaces is related in a paper read before the British Iron and Steel Institute (Journal I. and S. I., 1887, No. 1, p. 163), and need not be detailed here. These experiments continued through the larger part of 1885. At the beginning matters stood as follows:

Week Ending April 11, 1885.

Furnace.	Yield. Tons.	Pounds per ton of yield. Coke.
No. 5	1,055	2,506
No. 6	1,013	2,516
No. 7	1,148	2,676

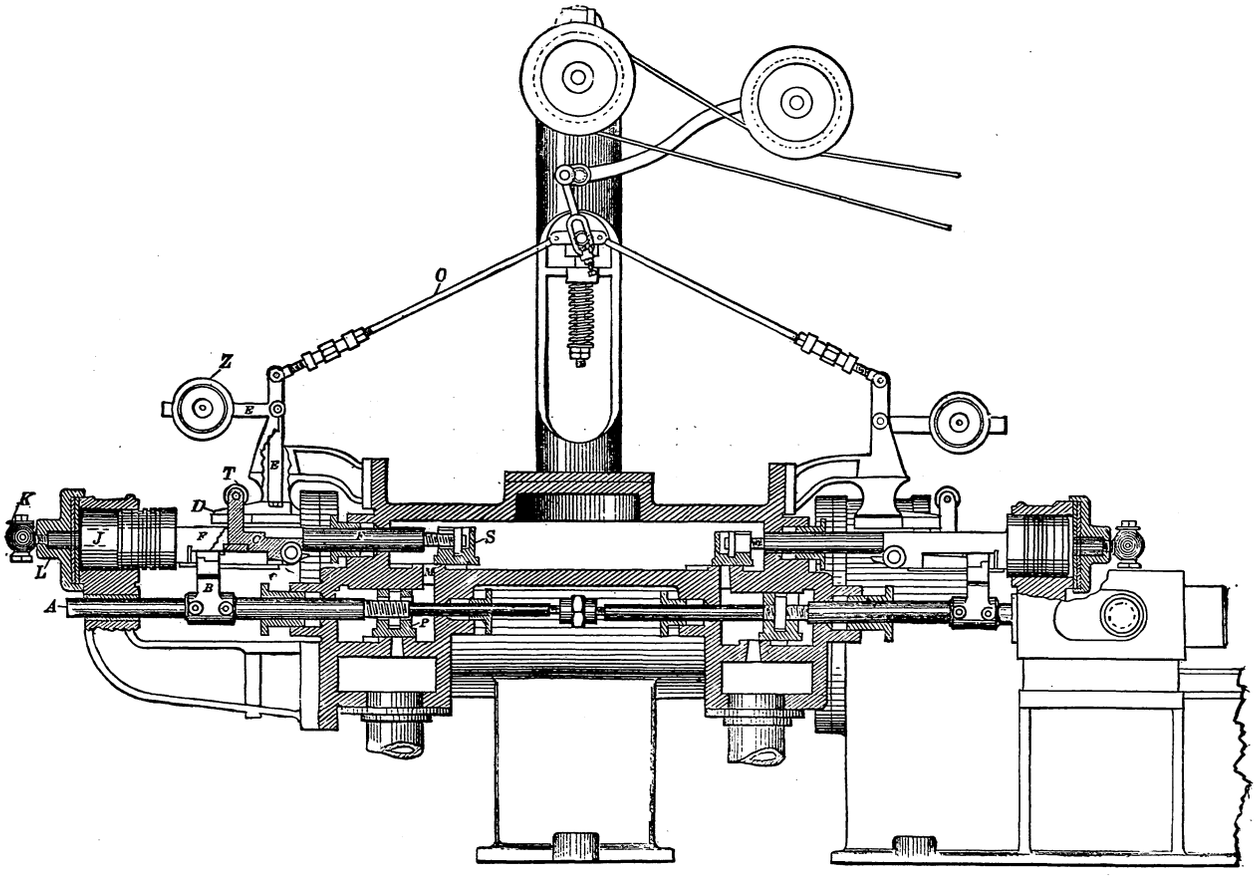

Fig. 2.—THE VALVE MOVEMENT OF THE THOMPSON ENGINE.

Month Ending April 30, 1885.

No. 5	4,840	2,342
No. 6	4,920	2,326
No. 7	5,167	2,622

It is proper to say that this was the first month of the campaign with No. 7. By the end of the year the situation was as follows:

Week Ending December 19, 1885.

Furnace.	Yield. Tons	Pounds per ton of yield. Coke.
No. 5	1,413	1,856
No. 6	1,402	1,898
No. 7	1,416	1,878

Month Ending December 31, 1885.

No. 5	5,752	1,912
No. 6	5,987	1,911
No. 7	5,926	1,892

And this continued to be the regular practice of these furnaces, though by 1887 still better results had been reached:

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Week Ending November 12, 1887.

Furnace	Yield. Tons.	Pounds per ton of yield. Coke.
No. 5	1,449	1,776
No. 6	1,394	1,759
No. 7	1,413	1,800
No. 8	1,255	1,867

Month Ending November 30, 1887.

No. 5	6,258	1,769
No. 6	6,040	1,801
No. 7	5,855	1,862
No. 8	5,377	1,902
Total	23,530	Average 1,834

Furnace No. 8 was then in the last month of its campaign. These four furnaces yielded, during the last six months of 1887, 133,427 tons of iron, with an average coke-consumption of 1919 pounds per ton of iron produced.

It has thus been shown that rapid driving and low fuel are not incompatible, and the American practice has at last been thought worthy of serious consideration by our European friends. But progress is still the order of the day with us. Edgar Thomson having developed the practice of rapid driving, and South Chicago having added thereto the possibilities of fuel economy, the Edgar Thomson furnaces, under the masterly management of James Gayley, again claim the attention of the metallurgical world by still more marvelous achievements in the way of large outputs, low fuel consumption and enormous increase in the life of the furnace lining. The last is the newest problem in furnace practice, to which furnace managers have been devoting their best efforts, and in which Mr. Gayley has been signally successful. One of his furnaces, which has just completed 37 months of its present blast (April, 1893), has made in that time 370,000 tons of metal, and is now running at the rate of 11,000 tons per month. There is no reasonable doubt that this furnace will make over 400,000 tons on this lining. Mr. Gayley has records of 623 tons in a single day, 3203 tons in a week and 12,800 tons in a month, from a single furnace. A record which compares with this, taking into consideration the difference in the size of the furnaces, is that of the Illinois Steel Company's Milwaukee No. 2 furnace. This furnace has 8150 cubic feet capacity, and was running on foundry-iron. The record is as follows:

Largest day, March 12, 1892, 225 tons of 2268 pounds.
Largest week, 1430 tons of 2268 pounds.
Largest month, 31 days, 6127 tons of 2268 pounds.
Average per day, 197.6 tons of 2268 pounds.
Fuel consumption, best week, 1824 pounds coke.
Fuel consumption, best month, 1925 pounds coke.
Grade of product, foundry iron, 75 per cent. No. 1.
Average sulphur for month, 0.032 per cent.

This record reflects the highest credit upon the manager, T. W. Robinson. The yield for this month is at the rate of 2.42 tons per 100 cubic feet capacity per day, which, I believe, has not yet been equaled. In 1879, the same furnace was making regularly 350 tons per week with a fuel consumption of 3500 pounds of coke per ton product. The alterations made in the furnace plant since that time consist in the substitution of fire brick, regenerative hot-blast stoves for the old iron pipe stoves, an additional blowing-engine, altered lines and a new manager. It is interesting to compare this record with that of Edgar Thomson furnace A of 1879 previously cited. The difference in the size of the furnaces is not so great—furnace A having 6400 cubic feet capacity—but the comparison serves to indicate sharply the progress made in 13 years. The records of these two furnaces stand as landmarks in the history of American blast furnace practice, the performance of A furnace in 1879 being as remarkable an advance over contemporaneous practice as that of the Milwaukee furnace of 1892 is over that of furnace A.

As if to further tax the patience and abilities of furnace managers there came into use almost simultaneously with the new *régime* the method, strange to America at least, of taking the pig iron direct from the furnaces in a molten condition to the Bessemer converters, known in this country as "the direct-metal process." The limitations which this procedure places upon the operations of the blast furnace are extraordinary, confining the furnace manager to very narrow fluctuations in the chemical composition of the product as well as the temperature of the furnace itself. In fact, after many years of faithful and well-directed effort, it has been deemed impracticable to depend wholly upon the steady mantenance of uniformity in the furnace operations; and an apparatus has been devised to equalize the variations of both chemical composition and temperature of the furnace product. This apparatus, known as a "mixer," was devised by the late Capt. W. R. Jones of the Edgar Thomson Works, and at once filled a "long-felt want," besides removing from the already overtried furnace manager a very considerable burden. It will be interesting, however, to note with what degree of success the furnace manager met the conditions required before the advent of the mixer; and to this end I give below the only data at hand bearing on this point. These consist of the daily averages of silicon and sulphur analyses of the product of the four South Chicago furnaces for certain typical periods. These furnaces were the first in the United States to be operated wholly and regularly on the direct-metal process, and were so operated for ten years before a mixer was introduced. The results here given I consider remarkable in their uniformity; and the success of these furnaces and of the entire South Chicago Works, as well as the permanent establishment of the direct-metal process in this country, is due largely to the very able and intelligent management of Mr. Michael Smith, who had charge of these furnaces for the ten years referred to. These daily analysis records have been kept from the beginning of the low-fuel experiments in 1885 to the present day; and the examples here given are not selected for their special excellence, as they can be many times duplicated, but to illustrate certain features of the practice which were operative at the time.

Table I.—Daily Averages of Silicon and Sulphur in Pig Iron, South Chicago Furnaces, May, 1886

Date. May.	No. 5. Si.	No. 5. S.	No. 6. Si.	No. 6. S.	No. 7. Si.	No. 7. S.	No. 8. Si.	No. 8. S.
1..	0.95	0.054	1.24	0.050	1.81	0.016	1.09	0 049
2..	1.82	0.030	1.52	0.031	1.36	0.030	1.61	0.022
3..	0.91	0.063	1.14	0.032	1 19	0.031	1.04	0.027
4..	0 91	0.079	0.80	0.070	1.24	0.045	1.00	0.037
5..	1.56	0 065	1.00	0.032	1.50	0.039	1.14	0 038
6..	1.34	0.048	1.66	0.016	1.24	0.050	1.15	0.054
7..	1.25	0.101	1.17	0.046	1.20	0.091	0.82	0.118
8..	1.34	0.082	1.18	00.50	1.33	0.104	1.38	0 060
9..	1.18	0.123	0.95	0.092	1.32	0.057	0.61	0.103
10..	1.23	0.065	1036	0.032	1 31	0.050	1.00	0.062
11..	1.10	0.048	1.04	0.039	1.06	0.064	1.54	0.019
12..	1.07	0.056	0 90	0.058	0.94	0.053	0.65	0.059
13..	1.40	0.073	1.39	0 035	0.89	0.123	0.34	0.159
14..	1.37	0.051	1.35	0.029	1 18	0.035	1.20	0.066
15.	1.28	0.040	1.28	0.038	1.71	0.020	1.31	0.035
16..	1.74	0.074	2.00	0.019	2.11	0.026	1.52	0.026
17 .	1.74	0.050	1.66	0.031	1.40	0.057	1.75	0.021
18..	1.29	0.048	1.28	0.042	1.16	0.074	1.76	0.021
19..	1.18	0.065	1.48	0.035	1.03	0.081	1.40	0.027
20..	1.56	0.070	1.18	0.050	1.07	0.064	1.26	0.031
21..	1.03	0.056	0.87	0.052	1.26	0.038	1.04	0.030
22..	1 20	0.036	0 84	0.047	0.98	0.064	1 38	0.017
23..	0.76	0.082	0.71	0.061	0 84	0.122	1.20	0.086
24..	1.20	0 082	1.38	0.025	0.85	0.149	0.89	0.041
25..	1.23	0.083	1.10	0.044	0.96	0.099	1.38	0.038
26..	1.27	0.080	1.32	0.035	0.86	0.113	1.28	0.048
27.	1.73	0.080	1.23	0.049	1.54	0.038	1.43	0.047
28..	1.98	0.046	1.37	0.057	1.46	0.052	1.58	0.046
29..	1.46	0.073	1 98	0.030	1.31	0.074	1.90	0.027
30..	2.06	0.073	1.73	0.021	1.77	0.034	1.86	0.035
31..	2.04	0.038	1.86	0.071	1.43	0.035	1 66	0.044
Av.	1.36	0.064	1 29	0.041	1.27	0.063	1.26	0.046

Table I, for the month of May, 1886, illustrates an effort to operate the furnaces so as to produce a pig iron as low as possible in silicon, to facilitate the blowing in the Bessemer department, at the same time keeping the sulphur within reasonable bounds. The fuel consumption in this case was a secondary consideration. The furnace records for this month are as follows:

Table II.—Daily Averages of Silicon and Sulphur in Pig Iron, South Chicago Furnaces, October, 1887.

Date. Oct.	No. 5. Si.	No. 5. S.	No. 6. Si.	No. 6. S.	No. 7. Si.	No. 7. S.	No. 8. Si.	No. 8. S.
1..	1 58	0.100	1.28	0.083	2.26	0.025	2.00	0.031
2..	1.98	0.063	1.21	0.056	2.51	0.016	1.21	0.031
3..	2.15	0.073	2.95	0.021	1.65	0.059	2.40	0.024
4..	1.98	0.086	1.60	0.079	1.83	0.098	2.21	0.036
5..	1 94	0.045	2.16	0.036	2.33	0.015	1.81	0.053
6..	1.46	0.071	2 13	0.026	1.99	0.024	1 77	0.054
7..	1.50	0.044	0.80	0.199	1.07	0.140	1.71	0.024
8..	1.70	0.044	1 72	0.078	1.99	0.039	2.00	0.029
9..	1.64	0.042	1.69	0.042	2.36	0.020	1.66	0 029
10..	1.92	0.023	2.06	0.022	2.07	0.047	2.49	0.026
11..	1.63	0.051	1.33	0.081	2.31	0.055	1.54	0.075
12..	1.92	0.054	1 56	0.059	2.04	0.041	2.10	0.036
13..	2.22	0.028	1.99	0.041	1.77	0.063	1.79	0.029
14..	1.69	0.070	1.48	0.041	2.14	0 032	1.61	0.044
15..	2.02	0.048	1.62	0.042	2.08	0.056	2.18	0.022
16..	2.11	0.027	1 57	0.056	1.63	0.074	1.50	0.057
17.	1.38	0.064	1.62	0.068	1.43	0.062	2.23	0.044
18..	1.77	0.043	2.13	0.048	2.33	0.045	1 67	0.052
19..	1.77	0.027	1.00	0.103	1.87	0 064	1.85	0.032
20..	1.51	0.043	1.30	0.059	1.62	0.093	1.37	0.060
21..	1.72	0.022	1.68	0.024	2.02	0.039	1.71	0.032
22..	1.94	0.032	1.72	0.032	2.18	0.034	1.82	0.022
23..	1.48	0.048	1.66	0.054	2.13	0.045	2.25	0.018
24 .	2.40	0.029	1.90	0.046	1.85	0.052	2.07	0.040
25.	1.60	0.045	1.55	0.042	1.81	0.082	1.53	0.129
26..	1 45	0.042	1 64	0.029	1.88	0.073	2.07	0.047
27..	1.14	0.101	1 55	0.028	1.83	0 071	1.88	0 053
28..	1.84	0 038	1.24	0 033	1.75	0.062	1.97	0.053
29..	1.76	0.035	1.26	0.066	2 31	0.048	1.82	0.065
30..	1.84	0.041	1.12	0.156	2.71	0.039	2.51	0 030
31..	1.40	0.064	1.98	0.032	1.77	0.086	2.23	0.039
Av.	1.76	0.050	1.63	0.057	1.98	0.055	1.90	0.042

Furnace.	Yield. Tons.	Pounds per ton of yield. Coke.
No. 5	5,250	1,961
No. 6	5,263	1,968
No. 7	5,599	1,918
No. 8	5,364	1,891

The higher lime burden necessary to keep the sulphur down in the very low silicon pig explains the higher fuel consumption.

Tables II and III illustrate an effort for the largest tonnage and lowest fuel consumption possible. With the furnaces going at their best rate, the fluctuations in silicon are slight and the percentage moderate. The steadiness of the sulphur is remarkable; in fact, the record presented by Furnace No. 8 I have never seen equaled. These tables show a continuous 60 days' run, and the records are as follows:

Month of October, 1887.

Furnace.	Yield. Tons.	Pounds per ton of yield. Coke.
No. 5	6,343	1,798
No. 6	5,995	1,848
No. 7	5,753	1,910
No. 8	5,598	1,871
	Total, 23,689	Average, 1,857

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Month of November, 1887.

Furnace.	Yield. Tons.	Pounds per ton of yield. Coke.
No. 5	6,258	1,769
No. 6	6,040	1,801
No. 7	5,855	1,862
No. 8	5,377	1,902
	Total, 23,530	Average, 1,834

These were the last two months of the campaign with furnace No. 8. The average fuel consumption for the entire blast of this furnace was 1979 pounds.

I would not have it thought that I have so far confined myself to the operations of the Edgar Thomson and South Chicago furnaces because these are the only furnaces in this country that are doing creditable work. It is true that a large share of the features of our modern furnace practice was developed at these establishments, as one might reasonably expect. The magnitude of these plants, their ample equipment and resources, and, above all, the raw materials at their command, have made it possible for them to lead in the exploration into new and unknown regions. It will be found, also, that the furnaces having the best records are those that use for raw material the ores of Lake Superior and Connellsville coke, a combination which, for excellence in smelting, cannot be duplicated in

Table III.—Daily Averages of Silicon and Sulphur in Pig Iron, South Chicago Furnaces, November, 1887.

Date. Nov.	No. 5. Si.	No. 5. S.	No. 6. Si.	No. 6. S.	No. 7. Si.	No. 7. S.	No. 8. Si.	No. 8. S.
1..	1.51	0.054	1.70	0.030	1.95	0.043	1.83	0.040
2..	1.49	0.066	1.19	0.058	1.86	0.044	2.14	0.039
3..	1.52	0.030	1.43	0.035	1.97	0.036	2.09	0.036
4..	1.32	0.046	1.54	0.028	1.54	0.030	1.98	0.056
5..	2.15	0.034	1.72	0.033	1.56	0.036	1.98	0.045
6..	1.50	0.031	1.09	0.054	2.25	0.032	1.99	0.066
7..	1.18	0.079	0.82	0.104	2.23	0.032	2.23	0.039
8..	1.76	0.029	1.73	0.029	1.76	0.065	1.96	0.049
9..	1.28	0.045	1.42	0.044	1.50	0.072	1.92	0.034
10..	1.20	0.046	1.43	0.056	1.80	0.039	1.80	0.047
11..	1.15	0.091	1.25	0.057	1.70	0.052	1.81	0.046
12..	1.66	0.047	1.24	0.099	1.59	0.066	1.72	0.047
13..	1.34	0.046	1.60	0.040	1.71	0.088	2.15	0.035
14..	1.87	0.043	1.12	0.082	1.64	0.076	1.98	0.032
15..	1.38	0.065	1.28	0.097	1.72	0.075	1.94	0.031
16..	1.46	0.048	1.24	0.129	1.50	0.087	1.92	0.035
17..	1.64	0.090	1.32	0.097	1.98	0.077	1.92	0.030
18..	1.60	0.078	1.66	0.072	1.98	0.074	2.03	0.043
19..	1.58	0.070	1.37	0.077	1.82	0.115	2.48	0.027
20..	1.47	0.094	1.66	0.052	1.98	0.093	2.03	0.034
21..	1.76	0.031	1.76	0.041	1.98	0.076	1.52	0.034
22..	1.43	0.089	1.85	0.056	1.57	0.070	1.98	0.029
23..	1.24	0.082	2.00	0.020	1.98	0.053	2.06	0.056
24..	1.57	0.080	1.51	0.056	1.52	0.074	1.79	0.057
25..	1.61	0.082	1.78	0.041	2.38	0.031	2.28	0.042
26..	2.14	0.040	2.47	0.028	2.06	0.049	2.36	0.036
27..	2.00	0.055	2.34	0.038	2.20	0.055	2.13	0.043
28..	1.42	0.138	1.68	0.067	2.64	0.030	2.68	0.026
29..	1.54	0.120	1.71	0.076	2.55	0.043	2.64	0.017
30..	2.18	0.054	1.71	0.076	2.32	0.047	2.37	0.064
Av.	1.57	0.065	1.56	0.058	1.91	0.059	2.06	0.041

the known world. This, however, does not preclude the ability of other furnaces to make excellent showings, due cognizance being had of the various conditions under which they are working. In no country on the globe does the smelting of iron present such manifold and varied conditions as in America. For fuels we have charcoal, coke and anthracite, the latter being peculiar to this country. Our ores embrace the wide range from brown hematites yielding 30 per cent. of iron to the rich magnetites and specular ores yielding 68 to 70 per cent. of iron. In the Southern States, where, ten years ago, the production of pig iron was insignificant, we find a series of blast furnace plants which, in excellence of arrangement, construction and equipment are finer than can be found in any other section of this country of equal extent and producing capacity, taken as a whole. These furnace plants, working with probably the poorest raw material in both ore and fuel that the country affords, are producing the cheapest iron in this country if not in the world, and are invading all sections of America with their product. The most famous record-breaking furnaces in the country have learned to recognize in these Southeners competitors worthy of their most strenuous and tireless exertions.

In anthracite practice, which concededly presents more difficult problems to the furnace manager than any other, the performances of the Warwick, Durham and Franklin furnaces, and the uniform excellence of the work of the Thomas furnaces, are evidence that the coke furnaces do not hold all the honors.

The charcoal furnaces occupy a unique position. Generally speaking, they are not brought into sharp competition with the coke or anthracite furnaces. Their product is usually of a special character and supplies a special market. By reason of the nature and source of their fuel supply, these furnaces are usually situated remote from the centers of industry and are to a large degree lost to public view. The plants are, for the most part, of rather antiquated type and limited capacity.

It is interesting, therefore, to note the performance of a recent charcoal furnace, modern in every particular and in size considerably larger than any other charcoal furnace extant. The Hinkle Furnace, at Ashland, Wis., was blown in for its first blast in 1888. The plant is entirely modern in its arrangement and equipment. The furnace is 60 feet in hight and 12 feet in bosh diameter, with a rated capacity of 100 tons per day. A single week's run, as published in *The Iron Age*, amounted to 1009 gross tons of iron, on a fuel-consumption of 80 bushels of charcoal per ton of product, the bushel being rated at 22 pounds. The performance of this furnace has clearly demonstrated what seemed to be a matter of doubt before, that furnaces of considerable size and modern equipment can be operated with charcoal as fuel and produce results as creditable, whether commercially or metallurgically considered, as any of the coke furnaces. In short, we have seen that any furnace plant, no matter what its conditions, will respond at once to careful and intelligent management, and the whole iron-smelting industry of America has thus been raised to a vastly superior condition as compared with its condition previous to 1879.

Uninterrupted operation is the *sine qua non* of the attainment of notable furnace records, and the development of modern American furnace plants has been made with this object steadily in view. Hence, a characteristic feature of these plants is the duplication of parts, with the view of forestalling as far as possible all contingencies and accidents which would interrupt the continuous operation of the furnace. This feature is made more manifest by comparison with our own older plants or with those of Europe. It is not uncommon at the present day to see in Europe, especially in England, whole furnace plants, often embracing half a dozen stacks, blown by a single gigantic engine, and the fume from all the boilers and stoves conducted off by a single mammoth chimney, both engine and chimney standing as monuments to human skill and daring. The larger they are, or the greater the number of furnaces depending upon their united efforts, the greater the credit redounding to their designer and builder. But if anything happened to either chimney or engine, an entire furnace plant would be placed *hors de combat*. The chimney may seem to be a tolerably reliable part of the apparatus, yet it has happened within the personal experience of the writer that the lining of a large chimney appertaining to the boilers of four furnaces fell in without a moment's warning, so that in the twinkling of an eye four large furnaces were deprived of power, and remained so for ten long dismal days. Since this episode I have lost confidence in monumental chimneys. In modern American furnace plants we find each stack built and operated separately and distinctly from its sisters. Even the custom of working furnaces in pairs from the same hoist is no longer considered the best practice, because an accident to the hoist would affect two stacks instead of one. Instead of the single gigantic engine, we find two, or even three independent engines provided for each stack; and in plants of two or more stacks the air receivers are so connected by a system of valves that any one engine in the house may be applied to any one of the stacks. Each boiler, or at least each pair of boilers, is provided with a chimney, so that here almost complete independence exists, the only part of the apparatus common to all being the main gas flue. Even in case of failure of this, it is possible to fire each boiler with fuel independently. While the majority of the hot-blast stoves now in use are so constructed that a common chimney is necessary, yet there are a number of the new types of stove that are provided each with its own chimney—a feature, in my estimation, of great value, as it renders each of the stoves attached to a furnace entirely independent. A furnace thus equipped could suffer the temporary loss of an engine, a stove, and two or three boilers without interruption in its operation.

The external appliances being thus provided for, the maintenance and prolongation of the life of the interior of the furnace—the lining—has in recent years received the earnest attention of furnace managers. The use of water-cooled plates inserted in the lining and about the wall of the furnace illustrates the ingenuity and courage of the modern furnace engineer; for the juxtaposition of cold water and molten iron separated by a film of metal a fraction of an inch in thickness is, at first glance, rather startling. By their aid the life of the lining has been materially prolonged, and, more valuable still, the lines of the boshes are steadily preserved at something near their original contour, thus greatly assisting in maintaining uniform performance of furnace operations. The performance of the Edgar Thomson furnaces, cited above, is a remarkable instance of this.

In the daily operation of the furnace no detail is considered too insignificant for careful study and improvement, since any one of these details may prove to be a point of vantage over a competitor. In this way the smelting of iron in this country has been perfected. The inspiration of such progress has been an emulation peculiarly American. In this country, with few exceptions, all works are open to visitors, native and foreign alike. The interchange of ideas and experiences between managers is free and unreserved. The better practice of one plant serves as a stimulus to others. To this friendly rivalry the present excellence of American furnace-practice is largely due. Great progress

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is well nigh impossible where every works is closely fenced and guarded, and where it is deemed high treason to reveal the least of the "secrets" of the process. American iron and steel works depend, not upon secrecy, but upon individual ability, for success and progress.

With the advent of the Bessemer process, the manufacture of steel became a most attractive field for our metallurgical and mechanical engineers. The marvelous evolution of this process and its associate industries demanded and developed brilliant minds. The process itself, attractive even to laymen with its brilliant pyrotechnics, its magical rapidity, and its ponderous and intricate machinery required for the manufacture of steel and its subsequent manipulation, completely overshadowed the prosaic operations of the blast furnace, and our young engineers and technical students sought the steel works as the only field worthy their attention in the metallurgy of iron. With the blowing in of Edgar Thomson A the possibilities of the blast furnace began to be made manifest. It was seen that laurels were to be won here; and technical students began to study iron smelting, with the result that the economical production of pig iron was found to involve quite as many scientific problems as the production of steel. Moreover, by reason of the high tension at which American furnaces are operated, they have become in our hands apparatus of a much more sensitive and nicely adjusted character; and the mind that directs them must be the more keen, alert and ingenious than was required when furnaces were driven at a more sober pace. Thus we find the larger number of our furnaces now in the hands of bright and talented men, whose intelligence and energy wrought the splendid evolution of American blast furnace practice.

The Westinghouse Electric & Mfg. Company will, it is reported, close their Newark works, with the intention of concentrating all of their manufacturing business in their new works.

The Lunken Gate Valve.

E. H. Lunken of the Lunkenheimer Company, Cincinnati, Ohio, has invented a new gate valve which is very ingenious and simple, and embraces a number of features. Its compactness is indicated by the fact that a 1-inch valve to carry 150 pounds working pressure weighs ¾ pounds less than the lightest common globe valve. The hub or bonnet is held to the shell by a coppered steel clip or strap surrounding the shell, with its ends passing through the ears of the bonnet and secured by nuts, O, Fig. 1. This clip is held from lateral movement by projections on the shell. The joint is packed by a hard lead washer $\frac{1}{64}$ inch thickness, the top faces of flanges each having a groove to properly secure the washer. The valve can easily be taken apart without renewing the packing washer. The hub or bonnet is flat and narrow and just of sufficient size to receive within it the valve disk when entirely raised, and has sectional or part-nut threads in its opposite interior sides. The threaded portion, J, Fig. 2, of the stem, by engaging with these part threads, causes the valve to be opened or closed. The disk has a straight flat face or bearing against the renewable seat C, Figs. 1 and 2, and is forced tightly against same by the self-adjusting wedging half ring or horseshoe D, Fig. 2, secured loosely in the valve shell. The wedging on the disk is applied on two wedging surfaces diametrically opposite each other, these coming in contact with the beveled ends of the half ring or horseshoe wedge; thus the wedging pressure is equalized on the entire disk and insures a tight joint on the opposite face. The pressure of the steam or liquid on the back or wedge side of disk also aids to make a tight closing valve.

All valves above 2½-inch size are provided with "by pass," which arrangement balances the disk before opening, and thus reduces the friction and wear on seat and disk and makes the valve open easily. The "by-pass" is shown in Fig. 3. It is an auxiliary valve formed in the top of the valve disk (immediately below the yoke that secures same to the flanged head of the stem H, Figs. 1 and 2) and is operated by the stem of valve, automatically, while opening or closing the main valve C. Channel N, Fig. 3, passing through the disk, connects the inlet or pressure side of the valve with the outlet side, and the end of the stem H controls this channel, there being sufficient play in the disk coupling to allow the complete opening of channel N caused by the first one-sixth turn of the wheel in opening the valve.

The renewable seat is an exteriorly threaded flanged ring that screws against a face or shoulder of the flange, the opposite side of which flange forms the seat or bearing surface for the disk to close against. The inner periphery of the renewable seat has lugs or teeth, K, Fig. 1, for the engagement of the spanner end of a wrench, by which means, after taking off the bonnet E, Figs. 1 and 2, the seat is tightened or loosened through the disk opening of the body without disturbing the pipe connections. In iron body valves the renewable seat C screws into a second brass ring, permanently fastened in the iron shell, otherwise, owing to the rusting qualities of iron, the removable seat might rust tight in the shell.

The wrench has a ring end which is used to hold and guide the removable seat into place, so as to properly start its threads into the threads in the shell. With the aid of the wrench the cheap seat is very quickly renewed. Another important feature is that the stem, when valve is full open, seats itself, V against U, Fig. 2, thus relieving all pressure on the stuffing box and permitting repacking of same under pressure. The tie band surrounding the shell adds to the strength of the valve and permits of its being taken apart easily with a small wrench. The shell is so short and rigid and the wedging surfaces are so small that expansion and contraction little affect it. Thus the disk will not wedge fast. Having but a single disk and the wedging half ring taking the place of a second disk

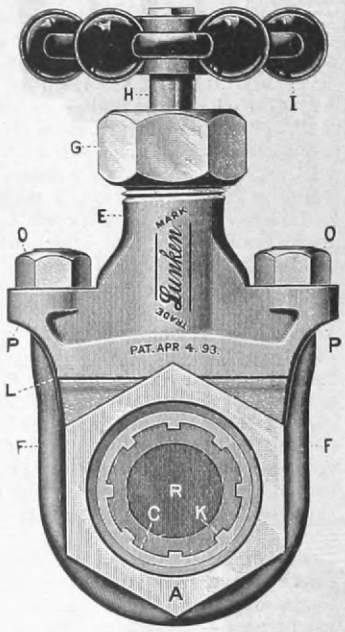

Fig. 1.—End Elevation.

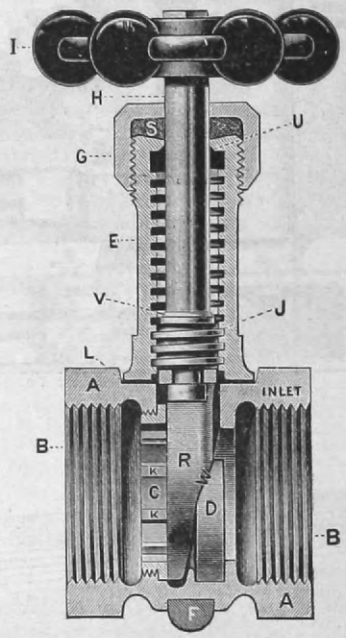

Fig. 2.—Longitudinal Section.

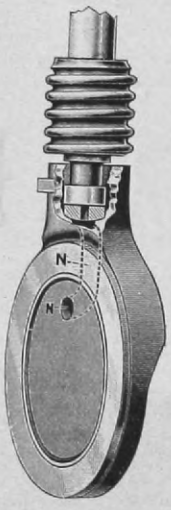

Fig. 3.—The By-Pass Valve.

THE LUNKEN GATE VALVE.

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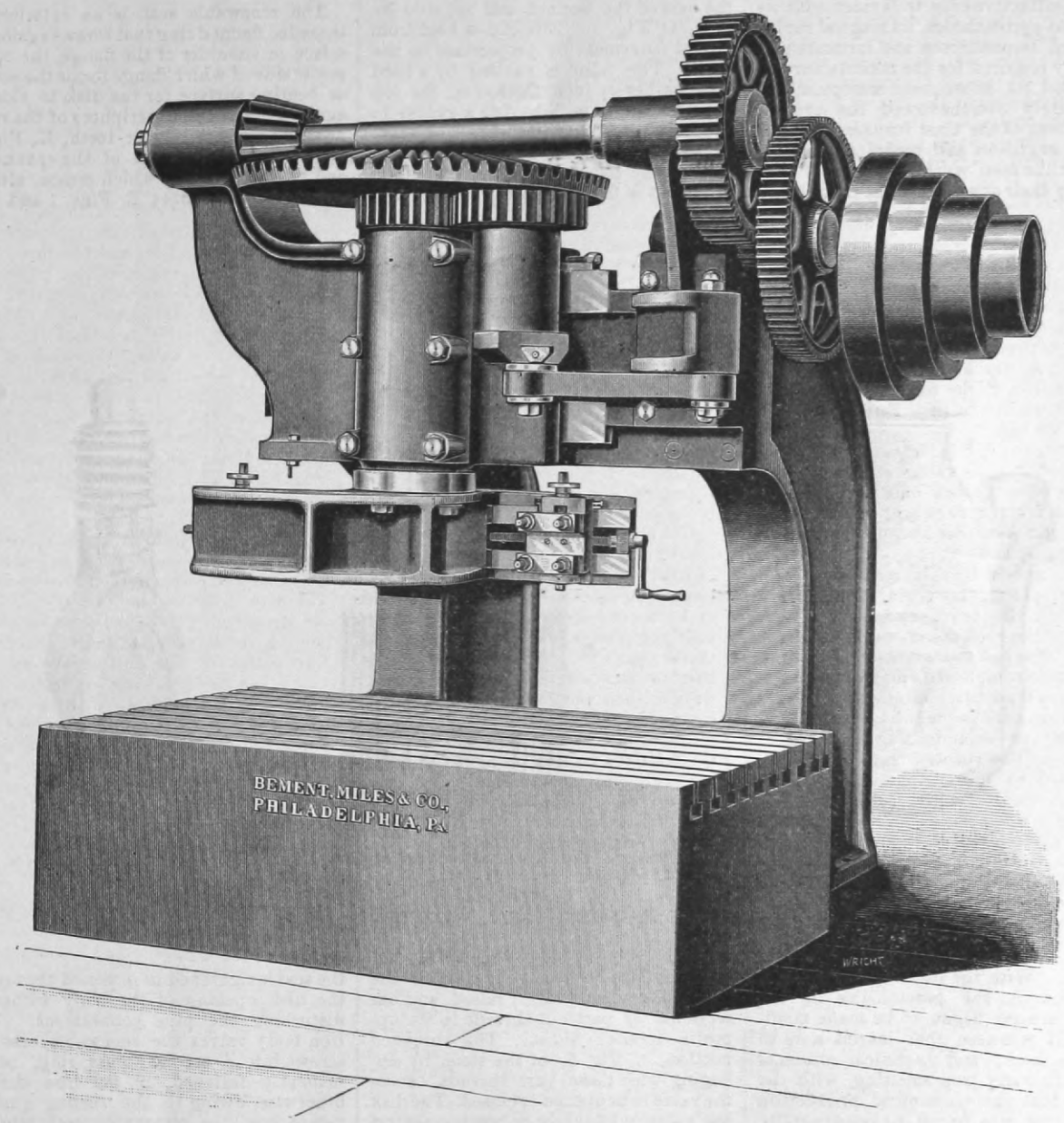
as a wedging resistance, this construction overcomes the objection in double disk gate valves where liquids remain in the shell between the disks and often freeze or injure the valve. Nothing can lodge on the seat of the valve, because the disk and seat have a parallel straight face, and as the pressure on the back of the disk keeps it tightly pressed against its seat it cuts away anything in its path. This feature, combined with the renewable seat, commends this valve for blow-off purposes. As regards outside finish, the shape and construction are such that necessitate only the finishing of the stuffing box, the balance being left a smooth casting, while the steel band and nuts are drop forged and copper plated to prevent rust.



THE BEMENT, MILES & CO. MANHOLE BORING MACHINE.

The Bement, Miles & Co. Manhole Boring Machine.

Bement, Miles & Co. of Philadelphia make a manhole boring machine, so designed as to cut either circular or elliptical holes as large as are ever needed in marine work. It is provided with two tool posts, both of which can be used on circular work, a single cutter being used on elliptical holes. The downward movement of the tool posts is by means of a star feed.

The arrangement of the machine for elliptical cutting is extremely simple, and it at the same time provides for heavy and accurate work. Motion is transmitted from the cone pulley through gears to a shaft mounted at one end in the top of the frame. The opposite end of this shaft is splined to a second shaft mounted in an arm which slides in suitable guides formed on the main frame. This second shaft carries the beveled pinion, which engages with the large beveled gear shown in the engraving. The shaft of this gear carries a spur gear engaging with a similar gear on a short vertical shaft, the lower end of which is formed with a dovetailed groove to receive one end of a stud to which one end of the link, which is connected at its opposite end to a stud in the main frame, is attached. The tool posts are carried on the lower end of the shaft, upon which is mounted the large beveled gear.

It is evident that when the axis of the stud of the left-hand end of the link (reference being had to the cut) coincides with the axis of the shaft carrying it, there will be no horizonal movement of the sliding arm and a circular movement of the tool posts will result. When the stud carrying this end of the link is moved away from its shaft there will be, at each revolution, a forward and backward movement of the arm and the mechanism it carries and an elliptical path will be traced by the cutters. This movement is permitted by the telescopic union of the two upper shafts. The tool post can be adjusted toward or from the center of the main shaft, in order to cut a circle of any desired diameter.

From the above it will be understood that when the machine is arranged for cutting an elliptical opening, the length of the minor axis of the ellipse will be governed by the distance of the tool post from the center about which it revolves, the length of the major axis being that of the minor plus the distance the arm travels each way at each revolution. Thus it will be seen that the machine can be set to cut an ellipse of any given diameters within its range.

Russian orders on an unusually large scale have given a great impetus to the Silesian rolled iron trade lately.

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WORLD'S FAIR NOTES.

Chapman Valve Mfg. Company

of Boston, whose works are at Indian Orchard (Springfield), Mass., make an exhibit in a conspicuous position on the central aisle of Machinery Hall. They have built an arched entrance composed of two brass pipes for columns which support a curved sign giving the location of the works and branch offices in the leading cities of this country and in London, England. These pipes are fitted with collars at short distances from one another, to which are attached valves, gates and cocks, in brass and nickel, beginning with very large sizes at the bottom and tapering to small ones at the top. At one side of the space are three large iron pipes supporting several tiers of straight-way water and steam valves, illustrating the variety of such devices manufactured by this company. In the rear is a fine walnut showcase containing highly polished brass valves arranged in tiers on two polished walnut pedestals. On one side of this case stands a column composed of gate valves resting on their sides, tapering from a very large one at the bottom to a very small one at the top. A similar column stands on the other side of the case, with the valves fitted with wheels. Fire hydrants are also shown.

One noticeable feature of this display is that the valves shown are taken from regular stock and not highly finished for the occasion, so that the visitor gets a correct idea of the quality of material and workmanship put into their goods by this well-known company. In all the power plants recently erected the tendency has been to increase the pressure of steam carried, so this firm call the attention of engineers to their complete display of valves and flanges especially designed for this class of work, and which have so fully met the severe demands made upon them. Among the special features shown, as applied to the Chapman high-pressure steam valves, with renewable bronze seats, are the outside screw and yoke, the by-pass arrangement, the ribbing of the body that it may not be affected by the expansion of the pipe line, and the self-packing feature on the spindle, by means of which the valve may be packed when wide open and the steam on the line. Both tongued and grooved and plain flanges are shown for high steam work, and may be used either bolted to valve or as flange unions. These valves may be seen in actual service as throttle valves in the Allis quadruple expansion engine, in Machinery Hall, as boiler stop valves on the Heine boilers, in the boiler house annex and at the power house of the intramural electric railroad, which has high and low pressure valves throughout, manufactured by the Chapman Valve Mfg. Company. The company make valves from ¼ inch to 48 inches in size, but only exhibit as high as 24 inches, as they are limited in space in Machinery Hall. In addition to the above mentioned are shown a complete line of brass and iron valves for feed and circulating systems and exhaust and low-pressure steam; also ammonia valves for mechanical refrigeration and valve and fire hydrants for use on water mains. The display is so arranged that each valve may be easily examined and shows all varieties of end connection, methods of opening, indicating devices, &c., in a most attractive and appropriate manner. Edward L. Ross, M. E., is in charge of the exhibit.

Davies Bros. & Co., Limited,

Crown Works, Wolverhampton, England, make an exhibit of galvanized iron in the British section of Machinery Hall, under charge of J. Bayliss, their American representative. A number of specimens of plain and corrugated sheets are shown; also pipes, elbows, crestings, &c. The Davies automatic galvanizing machine, owned and used by this firm, has just been introduced into the Whitaker Iron Company's works at Wheeling, where it has proved so satisfactory that the company propose to put in a second plant at their earliest possible convenience. The Cambridge Iron & Steel Company of Cambridge, Ohio, have also put in a Davies automatic machine, which is just getting to work in connection with a Wais & Roos leveling machine, made by the Wais & Roos Punch and Shear Company of Cincinnati. Mr. Bayliss is also negotiating with other galvanized iron manufacturers who are favorably impressed with the machine and expect to introduce it shortly.

The Niagara Stamping & Tool Company

of Buffalo, N. Y. (Section 28, Column L-46), make a very extensive display of tools and machinery for stamping, forming and cutting sheet metals. The exhibit includes almost the entire line of manufactures embraced in their revised catalogue of the current year, and is, therefore, a very complete exponent of the product of the establishment. The goods are all selected from the regular stock, and thus fairly represent their ordinary commercial quality. Among the larger machines may be mentioned several sizes and styles of punching presses, drawing presses, drop presses, squaring shears, bar and rod shears, and rotary, slitting and circular shears. Smaller sizes of the same class of machines are arranged for foot and hand power. All kinds of hand tools and small machines used for the various processes of manufacture of tinware and sheet-metal goods of every description are here represented and present a somewhat bewildering array, for their name is legion.

Manning, Maxwell & Moore,

111 Liberty street, New York, and 56 to 60 South Canal street, Chicago, make a magnificent exhibit of machinists' tools and supplies. They represent some 14 different manufacturers, whose specialties are shown in Machinery Hall or else in their World's Fair machine shop, which is located in an annex to the southwest corner of that building. In Section 25, near Column K 24, will be found the Ashcroft Mfg. Company's exhibit of steam, vacuum, hydraulic and other gauges, Tabor steam engine indicators, steam traps, water gauges pipe-threading tools, &c. So comprehensive is this display that the company may well claim that there is nothing required in steam, hydraulic or vacuum gauges which they do not exhibit. The specimens shown are tastefully arranged on large show boards covered with velvet or in glass showcases. Every one exhibited has a different capacity from the others, and is intended for a special purpose, duplicates being avoided. Sets of instruments are shown mounted on walnut and mahogany gauge boards, in different sizes, each board having a marine clock, steam gauge, vacuum gauge, steam pressure gauge, and revolution counter. The Consolidated Safety Valve Company on an adjoining space make a very fine exhibit of nickel and brass seated pop safety valves for marine, stationary, locomotive and portable boilers, also shifting valves, &c. The Richardson-Ashcroft patent solid nickel seated pop safety valves, with adjustable screw ring, are shown in all sizes for use on boilers of all kinds. These valves are shown in sections also, to convey a more thorough understanding of their method of construction and operation. They have been adopted by the United States Board of Supervising Inspectors of Steam vessels and approved by the Secretary of the Treasury. The famous engine, No. 999, of the New York Central, which pulled the first 20-hour train from New York to Chicago, is equipped with three of these valves. Among other exhibits by this company are the Blackall patent relief valve for locomotives, Richardson's farm engine and yacht valve, Richardson's shifting and water relief valves, &c. Next comes the exhibit of the Heyden & Derby Mfg. Company, consisting of Metropolitan injectors for feeding water boilers and ejectors of all classes. These injectors are shown in sections as well as ready for use, and comprise both automatic and double tube. They are in practical operation on the boilers in the exposition power house, on the steam launches used on the lagoons and on the whaleback, "Christopher Columbus," which plies between the center of the city and the fair grounds. In their comparatively brief career of about four years the company have sold over 50,000 of their devices.

Reverting to the World's Fair machine shop, it may be stated that the structure occupies a space of 125 x 90 feet. The floor is below the level of the floor of Machinery Hall, so that visitors coming in the several doors which afford access to the hall occupy an elevated position, looking down on the tools. A large number of these are in practical operation doing work for the exposition, all the countershafts being driven by two 20 horse-power electric motors. A Shaw patent three-motor electric traveling crane is rigged on an elevated track running the full length of the shop, with a skilled operator in attendance. It is rated at 10 tons, but has handled 14 tons with ease. Conspicuous among the tools in this shop are those of the Pond Machine Tool Company, consisting of newly designed planers, lathes, boring mills, &c.

The firm are exhibiting their standard 120-inch planer with four heads, whose bed is 44 feet 6 inches and which weighs about 80 tons. They show also a new pattern 54-inch planer with four heads, planing 16 feet; a 36-inch parallel planer with three heads, and a 30-inch planer with one head. They have all boxed uprights and a new feed box which gives a positive feed, and are all built for heavy cutting. Among the lathes exhibited are the new 1893 design, of which the largest has 54-inch swing and 45½-inch carriage. It is back-geared from a cone spindle, giving a very heavy gearing. A strong new apron, the center rest, and the tail stock are its features. The new feeding gear has been placed on the head and is worked by a lever pull. It has three feeds on every step of the cone, and possesses power angular, cross and lateral feeds. Among the other new patterns of lathes are the 48-inch triple-geared lathe, and the 36-inch triple-geared lathe having the same feed mechanism as the 54-inch. The company also exhibit a 30 x 24 inch heavy engine lathe, with large spindle, center bearings and a new

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apron. Among the other tools are two hand punches and shear, a full line of planer chucks, a new pattern 6-foot boring mill, with boxed housings, an 84-inch wheel press, one single axle lathe, one double axle lathe with hand crane of recent design, a 42 inch car-wheel borer, with a new crane, and a hub-facing attachment. In the main hall the same concern have in position their special tire-turning lathe and their 79 inch driving wheel lathe with quartering attachment.

The Tabor automatic molding machine is in operation making molds by steam power. In the machine shop there is a Hilles & Jones combined punch and shear, operated by an electric motor.

F. E. Reed & Co. have a complete display of engine lathes from 30-inch down to 10 inch swing, chucking lathes, hand and foot power screw-cutting lathes, whose boxes are specially prepared and whose beds have large bearing surfaces.

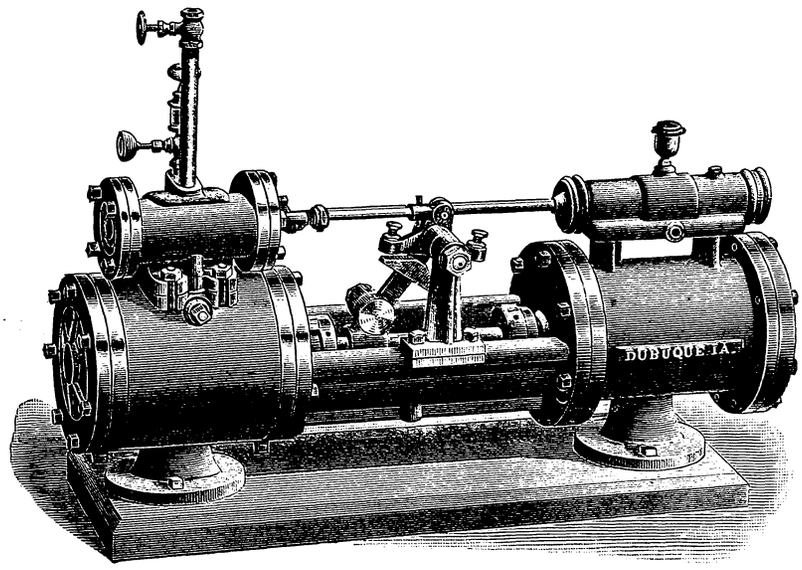
The American Machine Tool Company display three of their new cabinet drill lathes with taper attachment and a valve milling machine. They show, also, their new oil separator.

Gould & Eberhardt are represented with two of their drill presses, one of them with a tapping attachment and compound table. The same concern show their automatic gear cutter and two of their quick-stroke shapers.

Three sensitive drills are a part of the exhibit on behalf of the Segourney Tool Company, while a similar number of milling machines are displayed by the Kempsmith Machine Company of Milwaukee, the No. 4 universal attracting particular attention. The Yankee twist mill grinder is in operation. Leland Falconer & Morton Company display a double emery grinder of new design, while D. Saunders' Sons make a display of their pipe cutting and threading machinery. They have five machines in operation, cutting from 12-inch down. These machines are equipped with the new expanding dies and a new arrangement of the die heads. Sloan & Chase are in line with two model lathes with attachments, while the Westcott Chuck Company display a neat arrangement of chucks on a revolving stand. The Keystone Mfg. Company show their new nonpareil ratchet wrenches and attachments. Manning, Maxwell & Moore have established, at 60 South Canal street, Chicago, a store in which they are now carrying a large stock of machine tools, duplicates of many of them being on exhibition at the World's Fair. They have also a commodious office in the machine shop at the grounds.

The Smedley Air Pump.

A new form of air pump is herewith illustrated, which is the invention of E. Smedley, president of the Smedley Mfg. Company of Dubuque, Iowa. This is an air pump without valves. It has an air piston which is steam actuated, the air piston moving when the main piston has reached the end of its stroke. It is actuated by steam in such a manner that its movement is prior to the main piston movement, thus preventing what is known as "slippage," meaning the amount of air which slips by the valves in the old styles of air pumps in which the main piston always reverses its motion prior to the movement of the valves. The Smedley pump is at work in several chemical laboratories and manual training schools where perfect vacuums are required. A small pump, 5 x 6 inches, maintains a vacuum of 29½ inches of mercury very easily, working on three receivers, and as high as 29¾ inches is maintained. Patents have been obtained in the United States and Canada.



THE SMEDLEY AIR PUMP.

The naval court martial at Malta closed last Thursday after deciding that the captain and officers of the "Victoria" were free of all blame for the loss of that ship, which, by implication, rests upon the memory of the ill-fated Admiral Tryon. The court at the same time expressed regret that Rear-Admiral Markham, who was on board the "Camperdown," did not ignore the signal in attempting to obey which the collision occurred; adding, however, that it would be fatal to the best interests of the service to say he was to blame for carrying out the orders of his superior officer. Such a decision is manifestly the only one which could be arrived at.

Duluth News.

The Minnesota Iron Company, operating the Vermilion range mines at Tower and at Ely, laid off 100 more men at either place, and cut the wages of the remaining crews 10 per cent. A few weeks ago this company let out 400 men at Tower and 500 at Ely. All mining operations have been suspended at the Tower mines in shafts 1 and 3, while at the Ely mine—the Chandler—only No. 4 shaft will continue at work. The president of the company states that the directors are urging him to stop all work, except that of shipping. If this is done, several hundred more men will be thrown out of employment. The statement is made that the Minnesota could not to-day sell its ore for enough to pay the cost of getting out its ore. It was stated a year or two ago that this mine paid an average of $1.65 per ton for mining, while lake and rail freights are now about $1 60 more to Cleveland. Above these charges are some others, interest, commission, &c. The company have sold about 400,000 tons so far this year.

The new ore dock of the Duluth Missabe & Northern road, at Duluth, has been opened. It is 2380 feet long, has 400 pockets of 180 tons capacity each, and is by 950 feet the longest ore dock in existence. It does not appear a particularly favorable time to open a new ore dock, but the promoters of the road, which has spent in the past six months in tracks and dock $1,200,000, do not seem discouraged. The Mesaba continues to add to its list of shippers, and this week the Franklin mine, the property of Corrigan, Ives & Co., of Cleveland, and some of the Rockefeller family, sent out its first cargo.

On the Marquette range the Champion mine, though it has stopped all mining operations, is building large rock crushers to crush the immense quantity of ore in stock.

Straits Tin.

The store of tin in the mines of the Straits is said to be practically inexhaustible. A recent report from that district says that, in the opinion of practical men, these mines have been only superfically prospected so far. As more than half the tin supply of the world is obtained from the Straits, scarcity of the metal need not then be feared. The output of the mines has steadily increased of late years, and the increase is likely to continue. The following figures show the exports in tons:

1887	27,549
1888	29,169
1889	33,021
1890	31,976
1891	36,061

For the years 1890 and 1891 the principal shipments from the Straits, by countries, were as follows, the picul being 133⅓ pounds:

	1890. Piculs.	1891. Piculs.
United Kingdom	267,238	293,024
Austria	5,295	4,035
France	40,935	45,446
Germany	2,102	2,532
Holland	14,304	18,355
Italy	3,698	6,676
United States	118,243	163,647

These figures show a marked increase in the shipments to the United States, which may be attributed to the establishment of the tin-plate industry in this country during the latter half of 1891.

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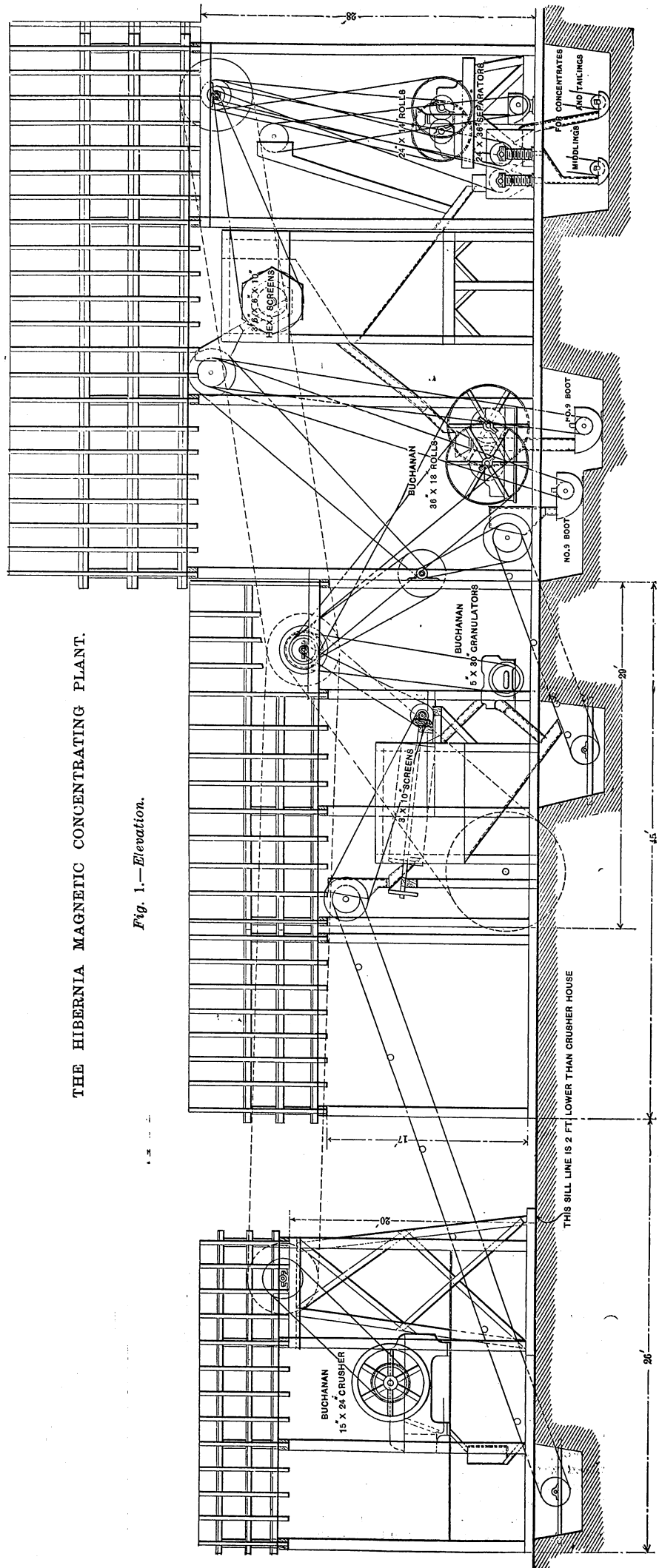
The Hibernia Concentrating Plant.

Since the discovery of the dip needle which is now so universally used to locate magnetic ore beds perhaps there has been no application of electricity or magnetism to iron mining so important as the process of magnetic concentration. This process has been but recently introduced, and considering that it is new, it may be considered a success. That it is only at the present time being perfected can be attributed directly to the recent demands of blast-furnace managers. Ten or fifteen years since it was not considered possible to use even a partial charge of fine ore without producing a scaffold or salamander; in other words, it was not considered possible for the air blast to permeate through the mass of finely crushed ore. Another reason why the magnetic concentrator was not perfected earlier was because blast furnace managers would accept and pay a high price for what is now termed lean ore, having at present no commercial value in its crude condition—that is, ore containing about 45 per cent. of metallic iron. A few years since 55 per cent. ore was considered rich; at present 55 per cent. ore does not meet with a ready sale and 58 per cent. and 60 per cent. is not considered exceptionally rich. This demand for richer ore naturally increases the cost and reduces the output of the stripping ore and also increases the amount of low grade ore, containing from 25 per cent. to 40 per cent. metallic iron, which is of no value whatever, but on the contrary is a source of great expense for handling, as it frequently happens that the dumping ground in the immediate vicinity of the mine is limited. The province of the magnetic concentrator is to utilize this waste material and produce a very high grade of ore, freed to a great extent from many impurities, such as sulphur, phosphorus, &c. It must be remembered that in a mine producing merchantable ore which can be shipped direct to the furnaces in lump at a profit, the cost of mining the second class, or concentrating ore, should not be charged against the concentrator, as in any event it has to be taken from the vein with the first-class ore and selected or cobbed out afterward. If a concentrating plant is properly located the cost of delivering the ore into the mill, at the mouth of the crushers, is no greater than the cost of hauling it to the waste dump.

The concentrating plant we illustrate in this issue was designed by C. G. Buchanan of New York. This plant will treat the low grade ores from the Hibernia, N. J., mines belonging to the Glendon Iron Company of Easton, Pa. The travel of the ore through the mill is entirely automatic. The floor of the crusher house is about 40 feet below the level of the mine tunnel. The approach is a substantial trestle work, terminating in a large ore bin capable of holding 400 to 500 tons, and placed directly above and in front of the large crusher, thus furnishing an ore reserve, so that the mill will not be entirely dependent on the ore cars for a steady supply of ore. After passing through the crushers, rolls and screens, it is fed by gravity to the separators, which are so arranged that the concentrates are fed by a spout into a bucket elevator, which discharges into a receiving bin, holding 500 tons, placed over a branch of the main railroad. This bin is furnished with a number of spouts and gates, so that cars can be loaded quickly and without handling the ore. The



THE HIBERNIA MAGNETIC CONCENTRATING PLANT.

Fig. 1.—Elevation.

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track is graded so that "empties" can be dropped down by gravity from the main line. The tailings are conveyed by means of an elevator and a rubber belt conveyor over the top of the loading bin and deposited about 200 feet from the mill. This conveyor runs upon a light trestle work 35 feet high, and is so arranged that when it becomes necessary it can swing to either side or can be lengthened, wire rope transmitters and angled sheaves or "bends" being used for that purpose.

The machinery in the mill is as follows: One 15 x 24 inch Buchanan ore breaker (weight 43,000 pounds), two Buchanan 5 x 30 inch double-jawed granulators (weight of each 12,000 pounds), and three sets of Buchanan steel crushing rolls (two sets of 36 x 18 feet, weight 34,000 pounds each, and one set of 24 inches by 14 feet, weight 13,000 pounds) There are two revolving screens, 3 x 10 feet, two very heavy Link Belt elevators, and two hexagonal screens, 6 feet in diameter and 10 feet long, with 5¼ inch hammered steel shafts. The main line of shafting is 4½ inches in diameter, speed 200 revolutions, while the intermediate line is

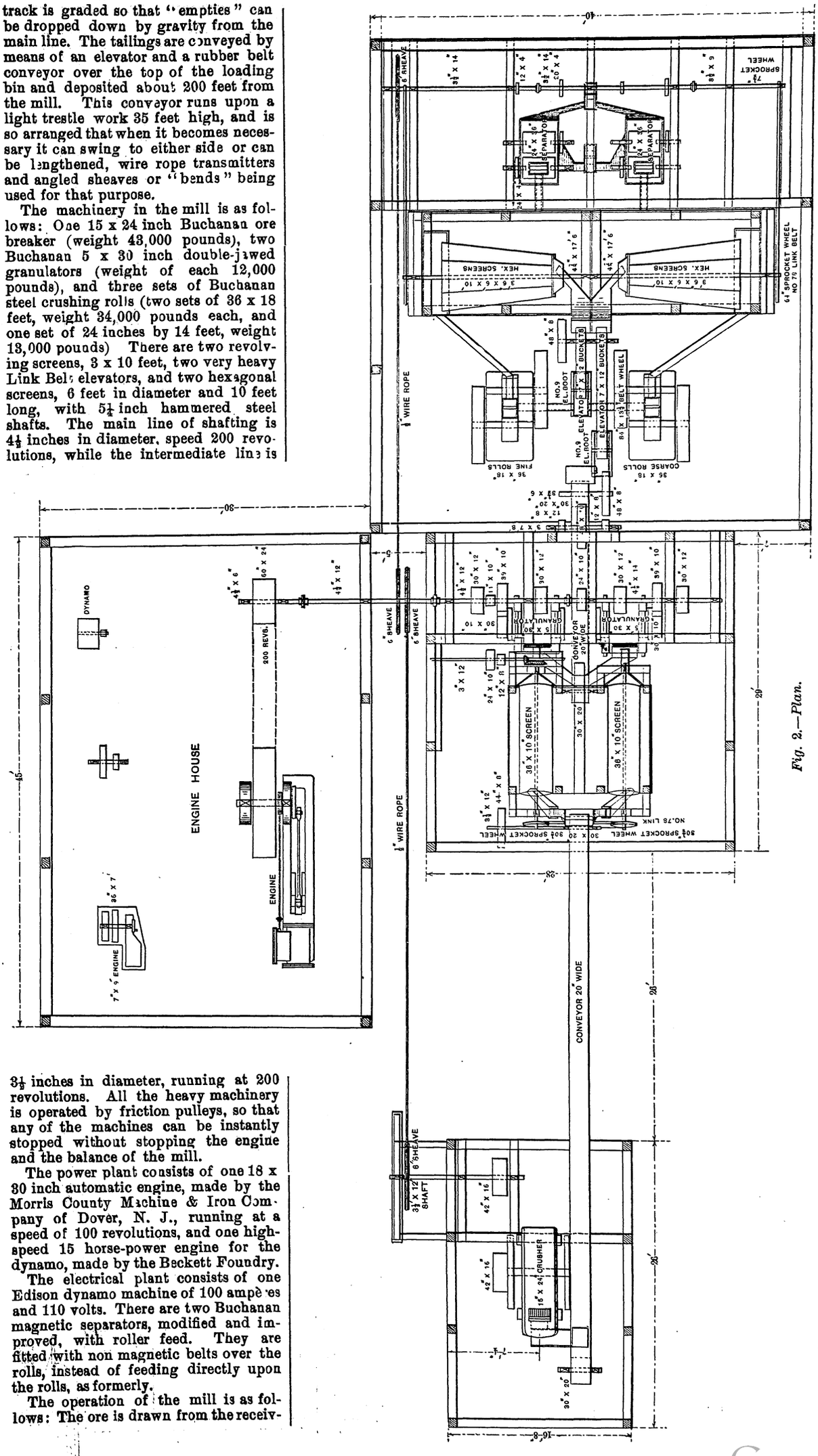

Fig. 2.—Plan.

THE HIBERNIA MAGNETIC CONCENTRATING PLANT.

3½ inches in diameter, running at 200 revolutions. All the heavy machinery is operated by friction pulleys, so that any of the machines can be instantly stopped without stopping the engine and the balance of the mill.

The power plant consists of one 18 x 30 inch automatic engine, made by the Morris County Machine & Iron Company of Dover, N. J., running at a speed of 100 revolutions, and one high-speed 15 horse-power engine for the dynamo, made by the Beckett Foundry.

The electrical plant consists of one Edison dynamo machine of 100 ampères and 110 volts. There are two Buchanan magnetic separators, modified and improved, with roller feed. They are fitted with non magnetic belts over the rolls, instead of feeding directly upon the rolls, as formerly.

The operation of the mill is as follows: The ore is drawn from the receiv-

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ing bin and passed through the large 15 x 24-inch breaker and reduced to about 3 inches. It falls from the crusher upon a 20-inch rubber inclined conveyor, running on concaved iron rollers, and is discharged into two 3 x 10 feet boiler plate screens drilled with 1¼-inch holes. All that passes through the screens is fine enough for recrushing in rolls and is conveyed by another 20-inch rubber conveyor to the main elevators. All that is too coarse to go through the 1¼-inch holes in the screen passes out of the end of the screens and is fed directly into the two 5 x 30 inch fine crushers or granulators. The product of the granulators falls upon the 20 inch conveyor (common to both) and is elevated to one of the hexagonal screens. An inclined screen is placed above the chute to the screen having ¾-inch holes, the overflow from which goes to the coarse crushing rolls and the fine direct to the screen. By the introduction of this screen undue wear is prevented in the fine screen. The overflow from the hexagonal screen also is fed into this set of rolls, while all that passes through the meshes of the screen falls into the ore bin over the separators. The product from the first set of rolls is discharged into a second link belt elevator and elevated to the second hexagonal screen, the fine ore dropping into the ore bin and the overflow going back to the second set of fine rolls for recrushing. It is then again fed into same elevator and screen, thus making the process automatic and continuous. As before stated, the crushed ore is fed by gravity from the screen bin to the separators, the concentrates are elevated to the loading bins over the track and the tailings are conveyed automatically to the dumping ground. The screens, granulators, elevators and rolls being in duplicate are so arranged that should any one break or get out of order or need renewal of parts the flow of ore can be diverted from one side to the other and the mill be enabled to run on about three-fourths capacity. Chutes, swinging gates and spouts are provided for this purpose. The capacity of this mill is from 200 to 300 tons of crude material per day. Excepting the main engine, the machinery was built by the Beckett Foundry Machine Company of Arlington, N. J., from designs made by their engineer, C. G. Buchanan, 143 Liberty street, New York.

During the first half of this year sheet iron for roofing purposes, guaranteed not to exceed $\frac{64}{100}$ pound per superficial foot was sold f.o.b. Ohio mills at $2.65 per hundred pounds, terms, 60 days' note or acceptance, or 2 per cent. discount for cash in ten days. This price was made by a mill possessing a good reputation and was considered "suicidal" among the trade. To-day any roofing concern having cash at their disposal would not have to hunt many days to find a mill ready to accept specifications at a very much lower figure.

A Washington dispatch of July 28 states that Acting Secretary Curtis, in a Treasury minute, has disapproved of the practice in vogue at the port of Philadelphia in regard to rights of withdrawal of merchandise, and decides that an importer who transfers the right of withdrawal to another abandons all his own right or interest in the merchandise and cannot again regain such right except by the act of the assignee himself, who may restore the ownership to the importer.

Changes in the Constitution of the Amalgamated Association.

The new edition of the constitution of the Amalgamated Association of Iron, Tin and Steel Workers has been published for distribution among the lodges. The organization is now named the Amalgamated Association of Iron, Tin and Steel Workers. This was made to conform with the change in admitting tin workers to the organization. A new section has been incorporated in Article III. It reads: Sec. 3. In the event of any body of manufacturers desiring to meet representatives of our association any time after January of any scale year to discuss and arrange scale or scales for the following scale year, provided that such scale shall always commence the July succeeding and end on June 30 following the date of commencement, the president shall appoint a committee to hold such conference. Hitherto manufacturers could not open negotiations until the general conference met.

Section 1, article V, provides for a change of date for holding the annual convention to the third Tuesday in May, instead of June, as formerly.

The new section 5 of article VI, referring to revenues, says: When the amount in the national treasury is less than $25,000 the president shall levy a special assessment of from 1 to 5 per cent. for two pays of two weeks per pay, or a period of one month, upon each member reported in good standing on the last quarterly report (except members on strike or out of work two weeks) which assessment must be collected by the financial secretary of the lodge and sent to the national secretary without delay.

Two new sections are added to the article defining the duties and powers of the Executive Committee. Section 6 reads: Where a dispute arises as to the class of a mill the president of the National Lodge with the Executive Committee will class the mill. Section 7 provides that where there are two or more mills belonging to the same company in the same district, or when, in the opinion of the Executive Committee, the interest of the association will be benefited thereby, the Executive Committee shall have power to call upon each lodge under said company, or in the district or a division of the district, to send one delegate to a meeting to be held for the purpose of considering such matter as the Executive Committee may lay before it.

Section 4 of the law governing strikes has been changed to read as follows, by inserting the part which we bracket: Any subordinate lodge entering into a strike in a manner provided by the laws of this association [provided that the amount in the national treasury is not less than $10,000], shall receive from the protective fund the sum of $4 per week for each member actually engaged in the strike in the mill over which the lodge has jurisdiction, provided they remain in the locality of the strike, or notify the corresponding representative of that lodge of their location and their being unemployed each week while on strike, and have held membership in the association for six months, are not in arrears and the lodge to which they belong is in good standing in the national association. Except a strike has been legalized three months prior to July 1, no benefits shall be paid to any member for any strike during the months of July and August. This section also applies to members who are standing turns in the mill on strike, and who hold no other situation except that of standing turns in that mill.

The following new article has been inserted bearing on the limitation of strike benefits: "Strike benefits shall stop after the payment of the thirteenth week. Should, however, the exigency of the situation be such as in the opinion of the president to demand it, he, with the Board of Trustees, may, at the expiration of the thirteenth week, extend payment for four additional weeks. At the conclusion of the time to which payment of benefits has been extended, if conditions are such as to clearly warrant it, further extension of payment may be made, the length of time to which payment is extended to be determined at the time the order is given."

A new feature is also the following series of rules for the composition and method of holding conferences:

RULE 1. The president shall negotiate with manufacturers with a view of bringing about a conference between them and representatives of the Amalgamated Association, which conference is to discuss the scale adopted by convention and arrive at settlement of scale rates for the year succeeding.

RULE 2. To the end that thorough representation may be secured, there shall be appointed by the president a General Conference Committee, composed of 31 members, who shall be selected with a view to their familiarity as to the trades that will be by them represented in conference, and, when found necessary, the president may appoint one or more members not then delegates to serve on such conference.

RULE 3. This General Conference Committee, after having been appointed, shall be divided by the president into three divisions, constituted and operating as follows:

RULE 4. Division No. 1, composed of nine members from the boiling department, which shall include boiling, scrapping and busheling, muck mill and knobbling, and this division shall alone confer with manufacturers in the settlement of the rates for trades given.

RULE 5. Division No. 2, composed of 11 men from bar, guide, plate, structural and jobbing mills working pipe iron. Any member of these trades having the necessary qualifications, as indicated above, shall be eligible to serve hereon, and this division shall confer and settle rates for trades given.

RULE 6. Division No. 3, composed of nine members of the sheet, tin and black plate and jobbing mills, and the branches directly connected therewith, and shall confer and settle rates for trades given.

RULE 7. The president and secretary of National Lodge shall be standing members of the General Conference Committee, and also of each division of the Conference Committee.

RULE 8. The president of the National Lodge shall, after consultation with manufacturers with whom conference is sought, arrange a method of procedure by which the scale can be taken up in conference in the order named, and the respective divisions shall be notified by the president of the readiness of the conference to proceed to the discussion of that class of trades in their charge.

RULE 9. In the event of one or more of the divisional conference committees arriving at a settlement, and the other or others failing to do so, the General Conference Committee shall meet and strive to effect a settlement. If after meeting the manufacturers in general conference they find themselves unable to secure agreement to the scale, the points in dispute and upon which disagreement arose shall be submitted (accompanied by such explanation as will fully present the points of difference existing, and such other statements as will show the gravity of the situation) to the sub-lodges, they to vote upon the points in dispute. In the event of the then scale year terminating and new scale year having commenced and no general settlement having yet been reached, the division or divisions that may have secured agreement are to resume work pending the result of the sub-lodges' action on the question or questions in dispute.

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RULE 10.—In submitting the matters in dispute to sub-lodges for action the secretary of National Lodge shall arrange voting sheets, which shall accompany the notice of the disagreement, and upon which shall be arranged the points of difference, opposite which on the same sheet shall be appropriate columns for the entry of the total votes in sub-lodge (negative and affirmative) on points submitted. This vote shall be taken and the sheets showing the result returned not later than 14 days after date of issue of such notice to secretary of National Lodge, who shall compile and arrange same preparatory to counting, when one member of each divisional conference committee last acting with president and secretary of National Lodge shall count votes cast, and it shall require a two-thirds vote of the total members of the organization voting (as shown by the returns), to insist upon the demands that had given rise to the disagreement.

RULE 11.—Should there be shown a two-thirds vote in favor of insisting upon the demands in dispute, then all lodges shall be notified by the president of the failure to arrive at a settlement, and such trades as resumed conditional operation shall upon a given day, not later than eight days after the vote had been counted, cease work and shall remain out until settlement is reached.

THE WEEK.

A larger proportion of customs duties at New York have recently been paid in gold coin than at any time since April, 1883.

A dispatch from Ottawa states that the figures of Canada's export trade for the fiscal year ending June 30, 1893, have just been compiled, and show that the exports exceed those of the previous year by $1,250,000, and are the greatest on record, aggregating $115,187,666. In 1892 the export trade amounted to $113,963,375, and in 1891 to $98,417,-296.

Croton water will, experimentally, be purified by an electrolyzing process recently tested by the Health Board. Serious complaints have recently been made by New York residents of the quality of the city's water supply.

A New York syndicate have, it is said, secured control of the cork trade through the country by the combination of the five largest cork works.

A small species of worm has made its appearance in the Northwest which is reported to be destroying whole tracts of forest trees in some of the heaviest timbered districts of Washington State.

Failures among farmers in Great Britain for the first half of the year were 40 per cent. over those of the corresponding months of last year. The agricultural depression is said to be unprecedented. Thousands of unemployed farm laborers are hovering in the outskirts of London, and more than 16,000 persons engaged in agriculture are living in sheds, barns, tents, vans or the open fields.

Political and financial troubles in South and Central America have, it is said, prevented the expected flow of visitors from those countries to the World's Fair. Steamship agents state that there has been practically no increase of travel from the South and Central American States to this country this year, although every inducement has been offered to tourists and the fair widely advertised.

A serious scarcity of vessels for carrying California wheat exists at San Francisco. Wheat freights have consequently made a decided advance. The increased demand for tonnage is occasioned by the wheat growers disposing of their crops immediately after they are harvested, the banks refusing to advance them money on warehouse receipts.

A financial novelty has been started on the Kootenai Lake, British Columbia. It is a floating bank which goes round in a steamer and transacts business by turn at the various towns on the lake, none of which are large enough to support such an institution single-handed.

The New York, New England and Northern Railroad was incorporated this week, with a capital of $3,000,000. A. A. Macleod is understood to be the controlling spirit of the undertaking.

Indictments have been made at Portland, Ore., against 15 persons, 8 of them being ex-Federal officials, for smuggling opium and Chinese laborers into the Washington and Puget Sound districts.

W. R. Lawson of the London *Financial Times*, who has just completed a somewhat extensive tour through the Southern States, is reported as saying: "I am going back to England with quite a cheerful feeling in regard to Southern roads. In fact, I think the South looks as though it would be the most prosperous part of the country this year. Iron industries are bad, but almost everything else looks well. The truck farming has increased enormously since I visited the South last. It is becoming a great source of revenue for both the people and the railroads."

Estimates for this year's Delaware peach crop put the probable yield at over 5,500,000 baskets. This will be by far the heaviest crop known within the last 25 years.

Dr. Wheeler, who was sent by the Treasury Department to Europe to inspect the sanitary condition of the more important seaports of the Continent, and to inquire into the arrangements for shipping immigrants, has returned to this country. He reports that the sanitary condition of the cities visited, namely, Hamburg, Bremen, Rotterdam, Antwerp, Marseilles and Naples, is far better than was the case last year. Every precaution is, he says, being taken to prevent the approach of cholera and to hold it in check in the event of its appearance.

The long distance telephone lines between London and Paris have almost superseded the telegraph as a means of communication between the stock exchanges of the two cities.

The drought in Northern Mexico has had the effect of causing the owners of haciendas to turn their attention seriously to the subject of irrigation.

The Mexican Congress has authorized the Executive Department for the next five years to make contracts granting franchises and concessions to companies that guarantee the employment of capital in the establishment and development of new industries in the republic, upon certain conditions, among the principal of which are that the minimum capital to be invested must be $250,-000 and that concessionaires must guarantee their compliance with the contracts by making deposits in bonds of the public debt. The duration of franchises will be graduated according to the importance of the industry, but will in no case exceed ten years. The capital will be exempt from all federal taxation, and the concessionaires will be permitted to import, once only, free of duty, the machinery, apparatus, tools, construction materials and other necessaries for their factories and buildings.

In striking contrast to her big neighbor—Australia—New Zealand has been enjoying a year of unbroken prosperity. The colony has had no boom, but an extremely profitable trade has been steadily and surely growing up for the past five years. Business has been uninjured by the bank crashes in Australia, and it is said that deposits in the New Zealand banks are as safe as if in the Bank of England. The outlook is regarded as very bright for a steady growth of progress and prosperity.

The prompt issue of consular reports on trade and commercial subjects is a feature of the State Department which is much appreciated by manufacturers and exporters.

California's wheat crop is estimated at 1,000,000 tons, or less than half what it should be.

Renewed activity is observed in the old oil fields in West Virginia.

The Canadian Pacific Railway Company contemplate the employment of electricity in drawing trains up Kicking Horse Canyon.

An ocean race of 15,000 miles, for a purse of $5000 in gold, between three big ships engaged in the carrying trade, commenced on July 28 from Philadelphia. The vessels are all English, and each carry 125,000 cases of petroleum, their destination being Calcutta.

Governor Lewelling of Kansas has started a project for opening up direct trade relations between Kansas and other Western States and European seaports by way of the Gulf of Mexico.

A tariff war has commenced between Germany and Russia. The latter country is about to add 50 per cent. on to her maximum tariff on German imports in reprisal of similar action on Germany's part in the matter of Russian goods. The opportunity should be a good one to market the agricultural productions of the United States in Germany.

The Franco-Siamese question has been the burning subject of interest in Europe during the past week. As things stand it seems to be in a fair way toward settlement, so far as the question of the blockade goes. The frontier question may revive disputes with Great Britain and China which may be more difficult of satisfactory settlement, in view of the near approach of the general elections in France. At one time things seemed to be perilously near a collision between France and Great Britain.

President Diaz is credited with the intention of inaugurating forthwith some radical economies in the administration of Mexico, prominent among them being a material reduction in the standing army of the republic.

Commissioner Mill has submitted to Secretary Carlisle a preliminary report of the operations of the Internal Revenue Bureau for the past fiscal year, which places the total collections from all sources of internal revenue at $161,-003,000, an increase of $7,145,000 as compared with 1892. The percentage of cost of collection had in the same period been reduced from 2.80 per cent. to 2.62 per cent. The principal articles which tended to the increase were spirits, fermented liquors, tobacco and oleomargarine.

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The Iron Age

New York, Thursday, August 3, 1893.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The Discouraging Outlook for Business.

The business situation steadily grows more unsatisfactory. Trade is shrinking in every direction, and all branches of business are participating in the distress which envelops the country like a dismal fog. The wail of the unemployed is heard on all sides. Factories are idle that had not been known to close except for repairs within the memory of the present generation. Towns that have never before felt the blighting touch of adversity are struggling with the problem of feeding the hungry, who almost outnumber the fortunate ones still blessed with employment. In a manufacturing city in the central West, possessing diversified industries in such an advanced state of development that its prosperity seemed founded on a rock-rooted basis, there is at present not a single establishment of any moment in operation, and a loaf of bread is not to be had on credit. The inhabitants have seen paralysis affect one industry after another, and they now understand for perhaps the first time in their experience what is meant by hard times. No relief is to be had by tramping to some other locality where there may be factories in operation, because those are probably running on half time or with a reduced force, and there is no chance for a stranger.

It seems like mockery in such a time as this to say that the country is really in a sound condition and that the distress is of an artificial character. But was there ever seen in the history of the world such a series of financial reverses among really solvent institutions? Manufacturers fail with assets largely in excess of their liabilities. Banks go to the wall with their safes filled with good securities. Merchants close their shutters because they are only in need of a comparatively small amount of cash to discharge pressing liabilities. In the throng of insolvents there are, of course, not a few who had attempted to carry too heavy a load for their capital, but this country can now show the most remarkable collection of solvent bankrupts ever seen under the canopy of heaven. Business men of all kinds have taken refuge in receiverships, that they may secure the protection of the courts in saving valuable properties that would be ruthlessly sacrificed in this crisis. There appears to be no value at present in any kind of property whatever, and to offer it for sale means to instantly depreciate it enormously.

The restoration of values appears to be a simple matter and to lie wholly with Congress. The early repeal of the Sherman act and the authorization of a bond issue to increase the gold reserve, thereby insuring the maintenance of our silver currency on a par with gold, would impart confidence to the people at once, and the further hoarding of money would be checked. It will, of course, require some time for trade to resume its wonted course, as the disturbance to business has been very great. There may also be some halting in certain branches of industry and commerce until it is definitely known what changes may be made in the tariff schedules. But the first thing necessary to check the awful demoralization in the business of the country is to re-establish our currency on a sound basis. To this end all patriots should earnestly work, and partisan cries should be stifled until it is accomplished.

A Doubtful Source of Revenue.

Iron and steel manufacturers smile grimly at the intimations that duties on iron and steel are to be heavily re-reduced. Such reductions are expected and many are putting their houses in order so as to meet the new conditions. But when the further statement is made that the object to be aimed at by such reductions is an increase in importations, thereby providing the national treasury with additional revenue, there is a general manifestation of skepticism. The subject is one which is worthy of analysis. The programme appears to contemplate the admission of iron ore free and the imposition of a low rate of duty on pig iron, steel blooms and billets. Iron and steel in other forms will hardly be permitted to stand as at present in the tariff schedules. It is assumed that our manufacturers will not then be able to dominate the home market as they now do, but that foreign iron and steel will be purchased by our people in large quantities to the benefit of the national revenues. The only certainty in this proposition is that the placing of iron ore on the free list will wipe out the revenue which has heretofore been derived from the duty of 75 cents per ton. Increased revenue from other articles in the iron and steel list through the reduction of duties is wholly conjectural. There may not be sufficient increase to balance the loss sustained by making iron ore free.

Taking pig iron, it will be found on carefully studying the situation that, even on the present basis of prices, a considerable reduction in the duty will not enable foreign pig to enter our markets except possibly at a few points directly on the seaboard. Southern pig might be driven out of a portion of New England, which is now a large market for it; but the substitution of foreign iron cannot be sufficiently heavy to make the national revenue from that source of very great consequence. There would be a much better chance for foreign pig, of course, if it were on the free list; but that would mean no revenue whatever, and the object of the reduction in duty would be defeated. It is very probable, on the other hand, that strenuous efforts would be made by our manufacturers to further reduce costs so as not to lose any part of their present trade, and in this they would have, as in the past, the co-operation of the railroads, whose managers would do what they could to retain such traffic over their lines. Prices are and for some time have been so low in the interior of the country that a reduction in the duty on pig would have no terrors for the inland makers with their market in their own immediate locality. It is a question, also, whether the abrogation of the duty on ore would not so benefit some furnaces on the Northern seaboard that they would be able to work to better advantage and capture trade now enjoyed by other domestic manufacturers.

Steel blooms and billets might be imported for a time to be used in Eastern rolling mills located a considerable distance from the steel works, but the revenue from that source would not be large, for the tonnage would not be heavy. As prices go now a very moderate duty, indeed, would shut out foreign steel as effectively as the present rate, which was established when prices were very much higher. The Pacific coast would, perhaps, prove the heaviest district in the country in consuming foreign steel, but the tonnage there cannot assume very large proportions until the population increases considerably. The manufacture of the other iron and steel products, except tin plates, has now grown to such dimensions and prices have been reduced to such a low point that reductions in duties will not invite importations unless the duties are made very low or wiped out altogether. In either case the national Treasury would not derive the revenue evidently desired and counted on by the reformers of the tariff. As to tin plates, the present duty brings in a very large revenue. If it were reduced 25 or 50 per cent. the revenue would be reduced just that much. The domestic manufacture of tin plates is growing, but not so rapidly as to seriously restrict importations, and large quantities will continue to be purchased abroad for years to come. Lower duties, under the circumstances, will not stimulate this trade. Arguing on the basis of the good of the national Treasury, loss in revenue will be sustained in this case most assuredly by a reduction in duty.

The fact is that the iron and steel trades of this country have been so well developed or are in such a peculiar condition that treasury financiers are not justified in looking for additional revenue by making changes in the iron and steel schedule. As it stands to-day it is perhaps most productive of revenue. Any changes made will reduce the national income from this source.

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In years past, when the iron industry was in a feeble condition a revenue tariff on iron and steel justified its name. That condition, however, has forever passed. Iron and steel duties, if reduced, will have to be reduced on some other ground now than with the view of providing more revenue.

Six Months' Production of Steel Ingots and Rails.

The American Iron and Steel Association has issued its figures for the production of Bessemer steel ingots and steel rails for the first half of the current year—figures which possess a good deal of interest. The output of Bessemer steel ingots has held its own in the most surprising manner, the production having been as follows:

Production of Bessemer Ingots.

States—Ingots.	First half of 1892.	Second half of 1892.	First half of 1893.
	Gross tons.	Gross tons.	Gross tons.
Pennsylvania.. .	1,218,504	1,179,480	1,137,179
Illinois.....	437,067	442,885	220,059
Ohio	200,946	208,909	232,980
Other States.....	202,411	278,233	301,939
Total Bessemer Ingots..... ...	2,058,928	2,109,507	2,092,057
Total Prod'ct'n Bessemer Pig Iron.	2,254,345	2,189,696	2,374,890

We have added the figures covering the production of Bessemer pig in order to indicate that the latter has been excessive and that the steel mills must be carrying considerable stocks of pig, which, of course do not appear in the totals compiled by the American Iron and Steel Association.

The most striking fact in the table is the great falling off in the production of steel ingots in Illinois, which is nearly one-half of that of the previous six months. Only a very small part of the decline is accounted for by the slackness of the rail trade, so that the manufacture of soft steel in the State has been less by at least 75,000 tons. The steady progress of the producers grouped under "other States" is accounted for pretty well by the work at Sparrows' Point and by the greater activity at the Colorado mill.

The tonnage of rails made during the first six months of the current year compares very favorably with the records of last year, as shown in the following table:

The Production of Rails.

States.—Rails.	First half of 1892.	Second half of 1892.	First half of 1893.
	Gross tons.	Gross tons.	Gross tons.
Pennsylvania.. ...	474,018	411,634	429,059
Illinois.....	240,925	209,617	170,263
Other States.	57,493	65,045	104,918
Total.....	772,436	686,296	704,240

It is probable that the quantity of rails of other section than the standard was greater this year than usual. The shipments of standard sections by the mills in the association was 571,884 tons up to July 1, to which must be added the work of the Colorado plant, which may carry it close to 600,000 tons. This would indicate an output of somewhat less than 100,000 tons in six months for light rails, girders and street rails.

Unfortunately there is little prospect that the second half of the current year will approach in product that of the first six months. Railroad renewals and construction are practically stopped now, and it will take months before matters are again in normal shape. If the year closes with a record of 1,200,000 tons the best has probably been attained under the circumstances.

China's Imports.

Very little definite information exists in this country relative to the magnitude of business in iron and steel with China. Some interest, therefore, attaches to a report by Consul J. A. Leonard of Shanghai on the imports into China during the years 1891 and 1892. We have compiled from it the following table:

Imports into China (Net) in 1891 and 1892.

Metals.	1891. Gross tons.	1892. Gross tons.
Iron:		
Nail rods.....	27,000	17,879
Bar....	11,824	7,965
Hoop.....	1,099	727
Sheets and plates..	4,094	2,637
Wire.....	3,768	4,003
Pig and kentledge.	3,820	5,779
Old.....	51,130	41,914
Tin:		
Slabs.....	4,010	3,986
Plates	1,235	1,149
Lead:		
Pigs..... ...	9,200	13,177
Tea and sheet.....	314	131
Copper:		
Bar, rod, sheets, plates, nails.....	458	546
Wire.....	75	84
Unmanufactured slabs, ore.....	2,277	1,812
Copper ware, unclassed.....	35	30
Yellow metal, bar, rod, sheets and nails	1,835	1,567
Brass wire.....	183	188
Steel.....	3,405	3,181
Spelter	806	2,652
Quicksilver	128	154
Metals, unclassed....	297,918	294,451

The total value of the metals imported is placed at $7,254,448 in 1891, and at $7,130,866 in 1892.

A new method of raising sunken vessels by air is being exploited by a Tacoma, Wash., concern. The plan is a modification of the usual system followed—namely, passing chains under the wreck, to which air bags are attached. In the plan pursued—it is said successfully—by the Grant Brothers of Tacoma collapsible rubber bags are placed in the hold of the sunken vessel by divers in sufficient numbers to displace, when inflated by air pumped into them by pumps on the wrecking vessel above, the water in the vessel's hold. This, it is said, gives the submerged hull sufficient buoyancy to make it rise to the surface. A press dispatch reports that the new method is likely to be tried on the wreck of the Cunarder, "Oregon," which lies in 95 feet of water about 18 miles southeast of Fire Island.

CORRESPONDENCE.

The Cambria Converter.

To the Editor: In your issue of the 27th inst. John Facer refers to the experimental converter used by the late William Kelly in his efforts to make steel in the early days of the method now in such general and successful use. The inclosed clippings from the Johnstown, Pa., *Daily Tribune* may serve to identify this converter as the one bought by the late Alexander Holley from Sir Henry Bessemer, although it may be only a copy in reduced size.

In James M. Swank's "Iron in All Ages," chap. xlv, it is stated that Robert Mushet produced rail and tool steel by the pneumatic process early in 1857, and that soon after Mr. Bessemer produced steel in commercial quantities by that process. In Mr. Kelly's monograph, in same chapter, he refers to having experimented at pneumatization of iron in the "run out" or "finery" fires with which his plant was equipped, but gives no dates as to successful results nor makes any mention of his experiments at the Cambria Works. As all efforts to make steel in the little converter were abortive, and as it came some years after steel had been made in England, it seems to represent only our best efforts to adopt what had already been invented abroad. Mr. Facer is correct in his surmise that there must be some mistake about this converter and the dates.

As this converter is now at the Columbian Exposition in the character of the Pioneer Converter of America, and entirely without ground for such claim, it might be only just to publish the facts stated in the *Tribune* article of June 2, 1892.

Very respectfully yours,

JNO. E. FRY,

5417 Penn avenue, Pittsburgh, Pa.

JULY 28, 1893.

We print below the article in the Johnstown *Tribune* which called out the letter by Mr. Fry following it:

"The first converting vessel used in the manufacture of steel is now a conspicuous object in the little lawn between the Gautier general office and the Walnut street bridge. It is mounted on a nicely dressed base of stone, and attracts much attention.

"The vessel was built by William Kelly, who claimed priority as the inventor of what is known as the Bessemer process of making steel, and it was first used in some experiments at the Cambria Works in 1857 and 1858. Since then it has been lying about the mills.

"After the flood it was thrown on the scrap pile, from which it was removed by order of General Manager Price and set up in front of the steel works.

"It was in the road there, and, besides, was regarded by Mr. Price as too much of a relic to be in hiding from the public, hence its removal to its present location."

To the Editor of the Johnstown Tribune.—SIR: The small Bessemer steel converter placed on Cambria's lawn, near the Walnut street bridge, is not, as you stated in your issue of to-day, the first converter used by the late William Kelly in his experimental work at Cambria in the development of the pneumatic process of steel making, now known throughout the world as the Bessemer process. Neither was it used at so early a date as you named, by several years. Mr. Kelly's labors here are

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quite within the memory of one, at least, of his co-workers, and his "experiments" and their accompanying interesting incidents can be recalled in minute detail.

The converter in question was not brought to this place until as late as 1863, and, as Mr. Kelly began his experiments at the Cambria Works in 1856, and used several apparatuses in the interval, it cannot —should not, in justice to Mr. Bessemer— be represented as Mr. Kelly's first apparatus, particularly as it embodies features of construction patented by Mr. Bessemer before they were even known to Mr. Kelly. The history of Mr. Kelly's efforts, as relating to the invention of the pneumatic process, is not yet written, however well it may be known by his co-workers.

The first converter used by Mr. Kelly at Cambria in 1856 was assembled from scrap-heap material, installed at the old blast furnaces, supplied with molten iron from the old foundry and with air blast from the furnace blast system at 4 pounds pressure. It was so crude in construction and abortive of results aimed at that its preservation would scarcely be creditable to any person identified with the early efforts to pneumatize iron into steel or to design apparatus for that purpose. If you think a description of it worth publishing, the undersigned will be much pleased to furnish the particulars of its construction, operation and immediate results.

Six years before the advent of the converter now on the lawn, as described by you, a quite large apparatus was built for and used by Mr. Kelly at the Cambria Works, in which a cupola furnace, gravitation troughs for molten iron, a fixed converter and run out chills were embodied. The results obtained with this plant were discouraging—to put it mildly—and were, therefore, in unhappy coincidence with all efforts made here by Mr. Kelly to emulate Mr. Bessemer's experimental results. This (comparatively) large plant was dismantled on demonstration of its inefficiency, but a very complete drawing of it—made at the time of its erection—is now in possession of the undersigned.

Mr. Kelly boldly tried to use the crucibles of the old blast furnaces on the hill side as converters, in an effort to convert their full contents of several tons of iron (made from Johnstown limonites) into steel, which was to have been cast in sand beds, where the iron was customarily run, "thus doing away with puddling altogether," as he so enthusiastically predicted would be the result, and this heroic effort was made fully five years before the coming of the "little converter on the lawn," and before its conception—by Mr. Kelly.

The small converter in question may serve to illustrate, when compared with those of to-day, the progress that may be expected within two decades from any beginning, however small, where the field of effort is practically boundless, as in the conversion of cast iron into malleable products; but, as an illustration of the limit of progress in pneumatic conversion of iron at the time of its use, it only represents the best American imitative effort of its day in the pursuit of metallurgical knowledge.

JOHN E. FRY.

JOHNSTOWN, PA., May 31, 1892.

Three 8 inch guns were shipped to the testing grounds at Sandy Hook July 28 from the Watervliet, N. Y., gun factory. Three more 8 inch guns will be shipped in a few days and soon after three 10 inch guns. In a few days the last big lathe will arrive at the Watervliet gun factory from the Niles Tool Works of Hamilton, Ohio. This lathe weighs over 100 tons and is the last of the contract for machinery from the Niles Tool Works. When this is put up the gun factory will be entirely equipped. The Pond Tool Company of Plainfield, N. J., are placing their last machine in position at the gun factory. It is understood that work will soon be given to several more skilled machinists in the near future.

The Carpenter Steel Works of Reading, Pa., are stated to be in receipt of heavy orders for projectiles from the Government. Their contracts now on hand will keep the works busy for some years.

Washington News.

(From Our Own Correspondent.)

The papers have had a great deal to say about the rehabilitation of the Committee on Ways and Means on new lines, with Representative Wilson of West Virginia at its head—some say McMillin of Tennessee. Mr. Wilson is a man of ability, but McMillin is too wild when he talks on tariff matters to be intrusted with such a responsible post as the chairmanship of a committee charged with the originating and passage of legislation affecting every industry in the land. Of the 15 members—10 Democrats and 5 Republicans—composing the Committee on Ways and Means of the Fifty-second Congress, every one except Mr. Shively of Indiana will sit in the coming House. If the Speaker, therefore, should propose to transfer Mr. Springer to some other committee he would be compelled to jump both McMillin and Turner in order to put Mr. Wilson in his place. If any purpose exists to displace Mr. Springer that gentleman is not aware of the contemplated humiliation. He devoted much time before he left Washington in May for his home, and subsequently at his home, compiling and arranging data for the contemplated revision of the tariff, which he proposed to have ready for the assembling of Congress in extra session, then anticipated for September. The change of programme for August, to meet the silver problem, is not supposed to have disarranged the schedule on tariff revision. Mr. Crisp does not talk on the personnel of the committees, but he does say that they should be in line with the policy of the administration on the two paramount questions of the hour. If Mr. Springer is in line, therefore, he will be safe, but the President and Secretary Carlisle will draw the line. It can be announced with the utmost confidence that it is the determination of Secretary Carlisle, as far as his department is concerned, among the other recommendations in the direction of a long list of articles to be put on the free list, to add the repeal of the provisional $2\frac{2}{10}$ cents tin-plate duty.

The grounds for this announcement is the fact that the Treasury officials, who are tinkering with Special Agent Ayers' report on the production of tin plate in the United States under the statute, have for some weeks been making a very searching examination of the proceedings during the protracted discussion of the tariff in the Fifty-first Congress. They wish to find some justification for such a course in the general tone of the debates and the admissions and alleged contradiction of facts and figures in sustaining the imposition of the specific duty, and the provisional legislation leading to free tin-plate if the development of the home manufacturer did not come up to a certain relation to importation of foreign tin in a given time

In event of failure to find sufficient grounds to satisfy their official consciences in favor of absolute and immediate repeal, the Treasury officials have also been examining the debates on the provisional portion of the tin-plate legislation in order to ascertain whether in the tinning of imported black sheets the product was to be considered as American tin plate and to be included in the statistics of American production. The department has not confined its inquiries to the home sources of information, but has instituted inquiries into the interpretation of these conditions in Wales. They wish to find out whether English black sheets tinned in Wales are embraced under the head of tin plate manufactured in Wales, or whether the tinning does not cover the black sheets to the extent of making them Welsh tin plates. The department is making determined efforts to get tin plate on the free list, if not by recommending what would be nothing short of a breach of faith by Congress with the American manufacturers—that is, immediate repeal—then by making it appear that the aggregate quantity of tin plate lighter than 63 pounds per 100 square feet produced in the United States during either of the six years next preceding June 30, 1897, has not equaled one third the amount of such plates imported and entered for consumption during any fiscal year after the passage of the act and prior to the above date.

The exclusion of foreign plates tinned in the United States from the statistics of the home product of tinned plate would make a serious difference, as may be seen from the product of 1891–2 fiscal year, July to June, when the relation stood:

	Pounds.
Amount of tin plates made from American black plates.....	9,300,000
From foreign black plates.....	4,300,000

These figures were more unfavorable from the department standpoint in the last two quarters of the calendar year of 1892, viz.:

From July 1 to December 31, 1892.

	Pounds.
Tin plates from American black plates.....	14,000,000
Tin plates from foreign black plates.....	17,000,000

There is a fixed determination to attempt some very radical so-called revision or reform of the metal schedule under the tariff act of 1890.

Schuylkill Valley Industries.

A special representative of the Philadelphia *Ledger* has been canvassing the manufacturing and agricultural industries of the Schuylkill Valley, and finds them to be in a very prosperous and healthy condition, despite the general business depression existing throughout the country and the fact that heretofore that district, on account of its great iron interests, has been usually among the first to suffer in similar times. Visiting a number of industrial establishments in Reading, Pa., and making inquiries, he found that all the large firms in operation a year ago are working to-day. The only failure of any consequence in the valley this year was that of the Reading Rolling Mills Company, whose works are, however, in full operation under the receiver. Some of the works are running with slightly reduced force, but they are finding a market for their product, and have no cause for complaint. The iron works and stove foundries are all active, except in the case of one or two concerns who are observing their annual custom of shutting down for a few weeks for repairs, &c. The good harvests in the region also tend to maintain prosperity. Crops have turned out exceedingly well, and farmers will have more money than usual. Many large furnaces are in blast; the banks are managed by able and careful officers, and, altogether, the 500,000 inhabitants of the Schuylkill Valley are more happily situated in many respects than those of many other sections of the country.

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Prices and Wages in Foreign Foundries.

In October last the Executive Committee of the Foundrymen's Association of Philadelphia requested the State Department to procure information concerning the foundry trade in England, France and Germany on the following points:

1. Is there any combination, association, or understanding among iron foundrymen for the regulation of the selling prices of their product?
2. What are the average wages paid for the different classes of labor in iron foundries?
3. What are the average prices paid by foundrymen for iron, fuel, sand and other materials required by them?
4. What are the average selling prices of the following different classes of iron castings:
   (*a*) Loam castings.
   (*b*) Dry-sand castings.
   (*c*) Green-sand castings, composed of light castings weighing less than 500 pounds and heavy castings weighing over 500 pounds.
   (*d*) Cast-iron water and gas pipes.
   (*e*) Steel castings.

In response to this a number of consuls sent information embodying reports concerning the prices obtained at different points for castings. These we have tabulated as follows, in order to afford a better opportunity for comparison, and have reduced them throughout to dollars per 100 pounds:

Selling Prices of Castings in England, France and Germany per 100 Pounds.

Locality.	Loam.	Dry Sand.	Green sand. Less than 500 pounds.	Green sand. More than 500 pounds.	Water and gas pipe.	Steel Castings.
	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
England:						
Birmingham	2.172 @ 3.041	2.606 @ 3.476	1.52 @	1.412 @	0.868 @ 1.086	6.52 @ ....
Bradford	2.59 @ 4.33	2.17 @ 3.46	2.17 @ 4.33	2.59 @ 3.24	1.40 @	3.92 @ ....
Gloucester	2.17 @ 2.43	1.74 @ 3.91	1.30 @ 2.61	1.30 @ 1.95	....	3.46 @ 6.51
Newcastle	2.17 @ 2.59	1.39 @ 1.83	....	1.19 @ 1.62	0.814 @ 0.877	3.83 @ 7.59
Nottingham	3.26 @	2.38 @	2.17 @	1.74 @	....	....
Sheffield	2.61 @ 3.91	2.17 @	....	1.74 @	0.97 @ 1.19	6.51 @ ....
Tunstall	3.04 @	2.61 @	1.95 @	1.51 @	1.41 @	....
France:						
Lyons	2.81 @	3.07 @	2.61 @ 9.61	2.19 @	1.53 @	8.77 @ 10.97
Marseilles	3.50 @ 3.93	3.06 @ 3.50	2.45 @ 2.80	....	....	....
Germany:						
Breslau	2.16 @	1.84 @	1.73 @	1.71 @	....	2.47 @ 3.03
Chemnitz	3.03 @ 3.79	2.38 @ 2.81	1.91 @ 2.38	1.71 @ 1.91	....	....
Duesseldorf	1.38 @ 4.04	1.68 @ 2.55	1.68 @ 2.55	1.68 @ 2.12	....	3.18 @ 16.36
Kehl	2.55 @	2.12 @	2.12 @	1.91 @	1.49 @	....
Mayence	1.93 @ 3.03	1.62 @ 3.03	1.51 @ 1.94	1.29 @ 2.15	1.59 @ 1.70	....
Lower Rhine and Saarbrück	1.84 @ 3.25	1.73 @ 3.00	1.51 @ 3.25	1.29 @ 2.15	1.59 @ 2.72	1.70 @ 7.05
Munich	2.38 @ 2.70	1.95 @ 2.49	2.27 @	1.73 @	1.71 @	7.54 @ ....

Some of the consuls sent elaborate replies, which deal with branches of the iron trade foreign to the foundry interest, and in some cases there is internal evidence in the reports of a lack of understanding of the subject. Details, however, are given by some of the consuls which we reproduce, since they possess special interest. Thus the consul at Birmingham reports the following detail prices on different articles:

Open-sand Castings.—Floor plates, side and end plates for furnaces, buckerstaffs or wall plates, and all flat castings made without being covered, $1.086 per 100 pounds.

Loam-sand Castings—Cylinders, $2.606 per 100 pounds; pump barrels, $2.172 per 100 pounds; general engine castings, $3 041 per 100 pounds; general light work, $3.041 per 100 pounds.

Dry-sand Castings.—Valves, $3.041 per 100 pounds; shells for valves, $3 041 per 100 pounds; air-pump buckets, $3.041 per 100 pounds; condenser boxes, $2.606 per 100 pounds; rolls and pinions, according to size, from $3.041 to $3.476 per 100 pounds.

Green-sand Castings.—Grates, stoves, sinks, gully traps, girders, spindles, boxes, crabs for machinery, &c., weighing less than 500 pounds, $1.52 per 100 pounds; weighing over 500 pounds, $1.412 per 100 pounds.

Chilled-Iron Car Wheels.—Light wheels, $2.606 per 100 pounds; heavy wheels, $2.172 per 100 pounds; chilled rolls—heavy, $2.606 per 100 pounds; under 12 inches in diameter, $3.041 per 100 pounds; under 8 inches in diameter, $3.476 per 100 pounds.

Cast-Iron Water and Gas Pipes.—Two inches in diameter, $1.086 per 100 pounds; 6 inches in diameter, $1.922 per 100 pounds; 12 to 18 inches in diameter, $0.868 per 100 pounds.

Brass.—The average market price in Birmingham for fair quality brass is from $8.146 to $8.47 per 100 pounds net. This delivered, say, in Philadelphia, would cost from $8.47 to $9.23 per 100 pounds, net, according to qualities, the latter being a good quality of brass. For gun metal various qualities are used and price varies considerably. From $10.86 to $11.94 per 100 pounds would probably represent the average price, delivered in Philadelphia. Wages of brass casters average about $12 per week to irregular workmen, but skilled workmen of steady habits who work from Monday morning until Saturday night can readily earn not less than $24 per week. All are paid by the piece.

The commercial agent at Magdeburg presents the following data relating to the selling price on different cast iron artices:

Average Selling Prices, at Works, per 100 Pounds.

	1890.	1891.
Cast Iron Stoves:		
Pfalza	$2.46	$1.94
Westphalian	2.23	1.74
Silesian	1.99	1.24
Bavarian	2.48	1.98
Self-Feeding Stoves:		
Silesian	2.21	1.92
Hartz	2.49	2.11
Iron Pots:		
Middle Germany	2.81	2.26
Lower Silesia	2.91	2.32
Enameled Pots (Middle Germany)	3.99	2.56
Columns, &c.:		
Silesian	1.89	1.40
Nassau	1.72	1.41
Light, High-Class Machine Iron: (Middle Germany)	2.59	1.83

Wages.—We have tabulated, so far as it is possible, the wages per week, as reported by the different consuls:

Locality.	Foreman molders.	Green-sand molders.	Loam molders.	Cupola men or melters.	Dressers.	Laborers.
	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
England:						
Birmingham	12.17	7.80	8.76	7 80	7 32	5.34
Bradford	....	8.25	8 75	5.83	5.71	4.39
Gloucester	....	9.24	9.73	....	4.86 @ 7.29	3.89 @ 4.86
Manchester	....	....	9.24*	....	....	4.86 @ 5.83
Newcastle	....	7.02 @ 7.15	8.64 @ 8.88	5.59 @ 6.24	....	4.62 @ 4.86
Nottingham	....	....	8.26*	....	....	4.86
Sheffield	....	....	9.25*	....	....	4.86 @ 5.83
Tunstall	....	....	8.28*	....	....	4.86
France:						
Marseilles	9.65 @ 14.48	....	5.16* @ 8.10	....	4.02 @ 5.16	3.42 @ 4.02
Germany:						
Chemnitz	....	7.86	8.58	....	....	3.60
Duesseldorf	....	5.70 @ 6 42	7.14 @ 9 42	5.70 @ 6.42	4.98 @ 5 70	4.26 @ 4.98
Mayence	....	4.26 @ 5.70	5.70 @ 6.42	....	....	3.48
Lower Rhide and Saarbruck	....	4.50 @ 5.70	5.70 @ 6.48	....	....	4.20

* Molders in general.

In a few instances more elaborate details concerning wages are given.

Railroad Statistics.

Poor's "Manual" for 1893 gives the total railroads of the United States up to December 31, 1892, as 175,223 miles, the net increase in the year having been 4429 miles. The mileage at the close of the fiscal years of the companies was 171,866 miles of main line track. The liabilities of these companies were $11,089,000,000, and the assets 11,482,000,000. Full statistics of operation were received from companies operating 170,607 miles, and on these the following figures are based. The revenue train mileage, exclusive of elevated railroads, was 865 000,000; the passenger mileage, 13,697,000,000; the freight ton-mileage 84,448,000,000. The total traffic earnings were $1,205,000,000, operating expenses $847,000,000, net earnings $359,000,000, other receipts $115,000,000, and total available revenue $473,000,000. The payments in interest amounted to over $239,000,000, and in dividends to a little over $83,000,000. The ton-mile rate for the year was 0.967 cent, which is somewhat better than the two preceding years, and nearly as good as the year 1889. The freight receipts per mile of railroad were the best since 1883, having been $4787. The tons of freight hauled per mile of railroad were 4392, the highest figure ever recorded. The tons of freight per freight-train mile were 161.21—less than either of the two preceding years, but greater than in any other year. The average haul per ton was 112.7 miles. The average passenger fare was 2.143 cents per mile, being the lowest ever recorded. The receipts per mile of railroad were $1721 from passenger fares, which is less than most of the preceding ten years. The passengers carried per mile of railroad were 3375 and the average train load 42.29. The interest paid on bonds and debt amounted to 4.38 per cent.; the dividends on stock to 1.68 per cent. and the total payments of interest and dividends to 3.01. The locomotive equipment at the end of 1892 is reported as 35,754; the passenger service cars at 34,221 and the freight cars 1,168,867. The miles of steel rail in track were reported as 182,858, being an increase of about 8000 miles; and the miles of iron rails were reported as 38,641, a decrease of 1100.

The latest Cunarder, the "Lucania," sister ship to the "Campania," has been delivered by her builders. She will make her preliminary trial trip on August 9 and sail from Liverpool for New York early in September.

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The Engineering Congress.

The greatest assemblage of engineers ever witnessed in the world came together in Chicago on Monday of this week. It was not the largest in point of numbers, but great in the *personnel* of the gathering, which included eminent engineers from all over the world. At the same time the number in attendance made a very good showing for such an occasion. President Charles C. Bonney of the World's Congress Auxiliary of the World's Columbian Exposition called the joint session to order at 10.30 a.m., in the Hall of Washington in the Memorial Art Palace, Michigan avenue and Adams street. Mr. Bonney made a very pleasant address of welcome, in which he alluded to the importance of the work done by the engineers connected with the several associations represented, closing with an introduction of O. Chanute, first vice-chairman of the General Committee of the World's Congress Auxiliary on Engineering Congresses. The chairman, E. L. Corthell, was obliged to be absent on account of impaired health. Mr. Chanute delivered an address of welcome in behalf of the local committee. Sir Benjamin Baker, builder of the Forth Bridge, was then called upon as the representative of the engineers of Great Britain, who made some appropriate remarks, paying a high tribute to the work accomplished by the World's Fair at Chicago and extending greetings in behalf of the oldest engineering society in the world, the Smetonian Society of Engineers. Baron Quinette de Rochemont next spoke as the representative of French engineers, making his remarks in French, which were nevertheless appreciated by the engineers. Mr. Chanute interpreted his address for the benefit of those who were not familiar with French. He was followed by C. O. Gleim, representing the associated engineering societies of Germany, who spoke in English very fluently, recounting the various societies for which he acted as spokesman, and dwelling upon the interchange of courtesies between American and foreign engineers. Hugo Koestler next addressed the congress as the representative of Austria-Hungary, speaking in German. Russia was well represented by Alfred Nyberg, whose address was made in English. The Chevalier Celso Capacci represented Italy, speaking in English. Responses were then made by William Metcalf, president of the American Society of Civil Engineers; Eckley B. Coxe, president of the American Society of Mechanical Engineers; Henry M. Howe, president of the American Institute of Mining Engineers; Prof. Ira O. Baker, chairman of the division of engineering educators; H. L. Harris, for the division of military engineering; Commodore George W. Melville of the division of marine and naval engineering. After a few announcements regarding receptions during the week at engineering headquarters, 10 Van Buren street, the respective divisions of the congress adjourned to different halls in the building.

Mechanical Engineers.

The meeting of the Mechanical Engineers was opened by President Eckley B. Coxe, who delivered an address of welcome, in which he dwelt upon the advantages to be derived from the assemblage of engineers for the purpose of discussing practical questions. He announced that the first session would be devoted to a number of routine matters, and that no papers would be read. The following committee was named on the nomination of officers for the ensuing year:

S. W. Baldwin, New York.
H. H. Suplee, Stamford, Conn.
J. F. Wilcox, Pittsburgh.
Harvey Middleton, Pullman.
Geo. A. Gray, Cincinnati.

Announcement was made that at 1.30 p.m. the members of all the engineering societies would be taken to the World's Fair by the whaleback steamer "Christopher Columbus," tendered for the occasion by the World's Fair Steamship Company. On arriving at the grounds they would inspect the movable sidewalk, be entertained in Music Hall by the engineers of the exposition, inspect the exhibit of Fried. Krupp, inspect the workings of the electric machinery operating the intramural railway built by the General Electric Company, examine the pumping machinery installed by H. R. Worthington, and in the evening be favored with a trip on the Ferris wheel, over the ice railway and on the lagoons in electric launches. Sundry other means of entertainment were set forth and the meeting adjourned until Tuesday morning. The following members and visitors were in attendance:

Eckley B. Coxe, Drifton, Pa.
F. R. Hutton, New York.
Wm. A. Pike, Minneapolis.
D. D. Drummond, Chicago.
Staunton B. Peck, Chicago.
J. Sellers Bancroft, Philadelphia.
R. G. Ewer, Natrona, Pa.
Charles W. Hunt, New York.
Franklin Moeller, Akron, Ohio.
Geo. H. Bryant, Palo Alto, Cal.
Frank M. Dunlap, Detroit.
Louis E. Reber, State College, Pa.
Jesse M. Smith, Detroit.
Curtis H. Veeder, Hermann Ritter von Littrow, Vienna, Austria.
C. M. Morse, Buffalo.
Edward G. Thomas, Butte, Mont.
Edward H. Parks, Providence, R. I.
Mattausch Tivadar, Budapest, Hungary.
Albert A. Cary, New York.
H. V. Loss, Philadelphia.
A. von Borries, Hanover, Germany.
A. A. Stevenson, Lewistown, Pa.
Henry E. Whitaker, Detroit.
Reinh. Hornell, Stockholm, Sweden.
Arthur Falkenau, Philadelphia.
Hans Konig, Vienna, Austria.
George A. Barnard, Salem, Ohio.
H. B. Roelker, New York.
Henry C. Meyer, Jr., New York.
William W. Varney, Baltimore.
Alfred Sorge, Berlin, Germany.
E. W. Thompson, Atlanta, Ga.
Seth B. Weaver, Chicago.
David S. Jacobus, Hoboken, N. J.
Frederick A. Scheffler, New York.
Edward L. Ross, Indian Orchard, Mass.
J. C. Cromwell, Joliet, Ill.
Thomas W. Capen, Chicago.
William Kent, New York.
John J. Flather, Lafayette, Ind.
Robert Allison, Port Carbon, Pa.
J. Atward Seymour, Auburn, N. Y.
R. C. Carpenter, Ithaca, N. Y.
Arthur Beardsley, Swarthmore College, Pa.
J. Wendell Cole, Columbus, Ohio.
Wm. T. Bonner, Chicago.
E. F. C. Davis, Richmond, Va.
Fred. J. Miller, *American Machinist*, New York.
Geo. I. Alden, Worcester, Mass.
Chas. D. Parker, Worcester, Mass.
Charles H. Manning, Manchester, N. H.
Geo. E. Whitehead, Providence, R. I.
L. A. Upson, Thompsonville, Conn.
Jos. J. Butcher, New York.
De Volson Wood, Hoboken, N. J.
T. R. Almond, Brooklyn.
George M. Sinclair, Philadelphia.
Ernest C. Barth, Chicago.
James Hartness, Springfield, Vt.
Stephen W. Baldwin, New York.
D. W. Davis, Chicago.
W. R. Macdonald, Chicago.
Lawrence Nordland, Medford, Mass.
A. D. Quint, Hartford, Conn.
H. W. Spangler, Philadelphia.
Carleton W. Nason, New York.
Paul M. Chamberlain, Waynesboro', Pa
C. L. Redfield, Chicago.
W. Morava, Chicago.
Charles Whiting Baker, *Engineering News*, New York.
William Forsyth, Aurora, Ill.
Norman C. Stiles, Middletown, Conn.
W. W. Dingee, Racine, Wis.
G. E. Dixon, Chicago.
Alfred E. Hunt, Pittsburgh.
George S. Morison, Chicago.
C. W. Jewell, Beaufort, S. C.
Peter Kirkevaag, Youngstown, Ohio.
Francis E. Galloupe, Boston.
Geo. T. Ashley, Indianapolis.
R. B. Owens, Lincoln, Neb.
Wm. Mason Towle, State College, Pa.
Vincent G. Hazard, Wilmington, Del.
W. S. Ackerman, Denver, Col.
S. Tompkins, Charlottesville, Va.
Alfred Vanderstegen, Ghent, Belgium.
Geo. W. Bassel, Cincinnati.
Chas. H. Morgan, Worcester, Mass.
T. H. Bregg, Bradford, England.
H. Kidd, Sydney, Australia.
Lewis A. Simpson, Paris, France.
W. W. Sprague, Chicago.
C. J. King, Madison, Wis.
John J. Hoppes, Springfield, Ohio.
Charles Whittier, Boston.
Geo. W. Weeks, Clinton, Mass.
W. E. Anderson, Blocksburg, Va.
E. H. Powell, Aurora, Ill.
Wm. L. Chase, Worcester, Mass.
Harvey Middleton, Pullman, Ill.
Geo. M. Bond, Hartford, Conn.
E. H. Parks, Providence, R. I.
Wm. Wilke, Philadelphia.
Ernest N. Janson, Washington, D. C.
C. V. Kirr, Fayetteville, Ark.
Clement F. Street, Chicago.
J. T. Taylor, New York.
J. S. Coon, Atlanta, Ga.
F. H. Ball, New York.
Wm. F. M. Goss, Lafayette, Ind.
Arthur E. Johnson, Stamford, Conn.
Alfred Betts, Wilmington, Del.
Fr. Freytag, Chemnitz, Saxony.
Edward P. Bates, Syracuse, N. Y.
R. H. Thurston, Ithaca, N. Y.
Gaetano Lanza, Boston, Mass.
W. B. Cogswell, Syracuse, N. Y.
W. F. Durfee, West New Brighton, N. Y.
Ed. E. Johnson, Chicago.
W. Voit, Berlin, Germany.
Wm. Ripper, Sheffield, England.
J. F. Lewis, Chicago.
A. D. Frick, Waynesboro', Pa.
H. S. Downe, Chicago.
P. Dunn, San Francisco.
Robert W. Hunt, Chicago.

(*By Telegraph.*)

The excursion to the fair yesterday was obliged to go by rail, as the lake was too rough for steamboats to land at the pier. The Mining Engineers held no session Tuesday morning, thus enabling their members to participate in the discussions of the Mechanical Engineers. The session of the Mechanical Engineers was well attended. It was opened by the reading of Chairman G. C. Henning's report of the Standing Committee on Uniform Methods of Testing Materials. A review was given of conferences held in Europe for the purpose of establishing uniform methods of testing materials, and it was suggested that the society memorialize the United States Government to send duly accredited representatives to the conferences abroad to further the movement of establishing international standards of tests. Mr. Henning then read a paper by Professor Debray, chief engineer of Ponts et Chaussees, in France, on the desirability of a general adoption by all countries of a uniform method for the tests of materials of construction. Resolutions presented by Chairman Henning's committee in favor of international standards of tests were then adopted.

Professor Martens of Berlin spoke in German in support of the movement to secure uniformity in the methods of testing. He said that the origin of the movement in Germany was due to a proposition emanating from Professor Egleston of this country in 1884.

S. W. Baldwin presented the following:

Resolved, That in view of the great importance of a uniform international system

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of testing materials this International Congress of Engineers request the Society of Mechanical Engineers to take such measures as will effectually further the object desired.

Adopted.

Chairman William Forsyth then read the report of the standing committee to recommend a standard method for testing efficiency of locomotives.

Professor Gaetano Lanza asked for the percentage of error liable to occur in making a 100-mile run, in reading the water glass at the beginning and at the end of the run, and also whether there was any insurmountable obstacle to using two indicators.

Mr. Forsyth replied that in making shop tests a water meter was used and that two indicators were placed on the cylinders at each end. Geo. Gibbs and E. D Meier also spoke on some special details connected with locomotive tests.

Prof. W. F. M. Goss then read a paper on Tests of the Pardue University Locomotive.

Professor Denton spoke in strong approval of the tests made. Locomotive engineers had long desired tests made of locomotives under the conditions applied to stationary engines, but there was difficulty in so doing because of the trouble in applying the load. The introduction of the water pressure brake did overcome this trouble. Such a brake enables the load to be easily applied and regulated. Many questions that cannot be settled by a road test can be easily solved by an apparatus of this character. The economy of various types of compound locomotives could thus be studied and worked out accurately.

Sir Benjamin Baker said that he would have been greatly pleased to have had this report some two months ago, when he was on the witness stand in a suit between the London & Northwestern Railroad and the Manchester Ship Canal. The tracks had to be elevated above the masts of vessels in the canal, and the canal was required to bear the increased cost of handling the railroad traffic over the heavy gradients. It was startling at the trial to hear the diverse testimony of engineers on the economy of types of locomotives.

Geo. Gibbs made a statement of his reasons for advocating shop tests of locomotives, while at the same time believing that the value of the whole machine could only be determined by road tests.

The secretary read an abstract of M. Mallet's paper on locomotives operated by total adhesion.

This was followed by the paper of A. Von Borries on compound locomotives.

A written discussion of this paper was contributed by John H. Cooper of Philadelphia, who gave some interesting historical facts regarding the Baxter compound locomotive as proof that it was the first successful two-cylinder locomotive run for any length of time, either simple or compound, at the will of the engineer.

Oral discussions followed, by H. H. Suplee and Geo. Gibbs.

The secretary next read a paper by A. Schneider on experience in working of rack railways. Messrs. Von Borries and Hildenbrand gave some interesting facts from personal observation on the working of rack railways with regard to the facility in the generation of steam, and comparisons between adhesion and rack railways, followed by Mr. Suplee, who spoke of the peculiar geological formation of Swiss valleys, illustrating his remarks by the use of the blackboard. Those valleys, being filled with debris from the sides of the mountains, constantly cause trouble to the railroads whose beds are located on the sides of the valleys. The roads are now being constructed in the centers of the valleys, with rack railways to carry them up steep inclines and over into adjoining valleys when necessary.

Chairman Nason then read the report of the Standing Committee on Standard Flanges, giving a statement of what had been done in conjunction with the Master Steam and Hot Water Fitters. The efforts made to secure the adoption of standard flanges by manufacturers is making general progress, only one concern having thus far refused to do so.

PERSONAL.

D. L. Browne, for a number of years identified with the Vulcan Forge & Iron Works, operated by the Lockhart Iron & Steel Company of Pittsburgh, has resigned his position with that firm, and is now connected with the W. DeWees Wood Company, manufacturers of patent planished sheet iron, with works at McKeesport, Pa.

Sir Benjamin Baker, the English engineer, has arrived, on his way to the Chicago congress.

A. S. Hay, one of the partners of the firm of Naylor & Co., has returned to England.

OBITUARY.

CHARLES FRANCIS WASHBURN.

Charles Francis Washburn, whose portrait we print this week, died on Thursday morning, July 20, at his residence in Worcester, Mass. He was stricken with apoplexy on July 1.

Charles Francis Washburn was born in Harrison, Cumberland County, Maine, August 23, 1827, and was the son of Charles Washburn, a twin brother of Ichabod Washburn, the founder of the mammoth industry of the Washburn & Moen Company. His father was a practicing lawyer in Maine, but he abandoned a good business to come to Worcester to join his brother Ichabod in his industrial vocation. The son received a fine high school education, but on account of ill health did not take a college course, as he intended doing. He supplemented his academic attainments by travel in Europe. He early exhibited a taste for mechanics, and his first efforts in a business way were as an operative in the works of his father and uncle in Worcester. Connected with these works he remained until his death, rising from one position to another until he became vice-president and secretary.

CHARLES FRANCIS WASHBURN.

It was in 1835 that Charles Washburn came to Worcester from Harrison, Maine, and formed a copartnership with his brother Ichabod, which continued until January 13, 1838. In 1842 he again became a partner in the business, and the firm made purchases of land in South Worcester. At this time there was a demand for telegraph wire. In 1847 the firm commenced to look around for a location for a rolling mill, the wire rod billets before that time having been purchased in Sweden.

The water power in Quinsigamond attracted their attention, a small part of the power being used by a paper mill.

Under their patronage a new firm was organized to carry on the rod rolling and wire business under the title of Washburn, Moen & Co., Henry S. Washburn and Philip L Moen being new members of the corporation.

This company was dissolved in 1849, and Henry S. Washburn carried on the business. January 1, 1849, the copartnership existing between Ichabod and Charles Washburn was dissolved, the manufacture of wire in the various branches being continued at the Grove street mill by Ichabod Washburn.

A division of the property was had, Charles Washburn taking the Quinsigamond plant.

January 2, 1853, Henry S. Washburn formed a copartnership with Charles F. Washburn, and they continued rolling rods and manufacturing iron and wire, under the firm name of Henry S. Washburn & Co., at Quinsigamond. Meanwhile Ichabod Washburn had made considerable progress in the manufacture of wire, particularly of card wire, introducing new processes. The Swedish bars were rolled at the Quinsigamond mill. The capacity of the Quinsigamond mill was six long tons a day.

In February, 1856, the Quinsigamond

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Mills consisted of a building 150 feet front with two wings extending back 150 feet, and the works covered 1 acre of ground. Here were manufactured Brazer's screws, rivet rods, bright and annealed market and telegraph, spring, fence, bucket and bail wire. The daily product was 10 tons, and 85 operatives were employed, the annual product of the mill being valued at $300,000.

In 1857, the partnership of Henry S. Washburn and Charles F. Washburn was dissolved, and May 1 of that year Charles Washburn and Charles F. Washburn formed a copartnership under the name of Charles Washburn & Son, and continued the business at the Quinsigamond Works.

The firm manufactured most of their common market wire from scrap iron. In November, 1862, the Quinsigamond Works were totally destroyed by fire. They were rebuilt, and August 4, 1865, the Quinsigamond Iron & Wire Company, who succeeded to the business of Charles Washburn & Son, was organized.

In February, 1868, the Quinsigamond Iron & Wire Works, and the Washburn & Moen Iron Works were consolidated under the name of the Washburn & Moen Mfg. Company.

For 45 years Mr. Washburn had been connected with the wire-drawing industry, and since 1875 had also had full charge of the barbed-wire department of the Washburn & Moen Company's works. It was through his foresight that the barbed-wire patents were purchased, the principal patent being gotten out by J. F. Glidden, a farmer living in De Kalb, Ill. Glidden made a few rods of the wire, which he used on his own farm, and its manufacture in a small way was commenced in De Kalb. The first barbed wire actually sold for use was in 1874, and in 1876 the Washburn & Moen Mfg. Company, at the suggestion of Mr. Washburn, investigated the process, purchased the patents, which were several in number, issued to L. B. Smith of Ohio, W. D. Hunt of New York and Michael Kelley of New York.

The Glidden patent was issued in 1874. As the wire became extensively used and became popular throughout the West, infringers began to spring up and litigation followed. Mr. Washburn spent considerable of his time in Illinois during the several legal contests, looking after the interests of his company. To protect themselves, the Washburn & Moen Company purchased upward of 250 patents upon barbed wire and barbed-wire machinery.

Mr. Washburn filled the offices of vice-president and secretary of the corporation for a long period of years.

HENRY C. LINN.

Henry C. Linn of Chicago died on the 25th ult. as the result of a paralytic stroke. Mr. Linn was born in Windsor, Maine, February 14, 1849, and at the age of five years went West with his parents who settled in Lee Center, in Illinois. At the age of seventeen years he removed to Chicago with his mother and older brother, his father having died a few years before. He held a number of responsible positions and then became associated with the Forest City Varnish Company of Cleveland, Ohio, as Chicago manager. Eleven years ago he became resident manager for the Berry Brothers Varnish Company at 214 Randolph street, which position he held at the time of his death.

Copious rains have greatly improved the prospects for crops in the Northwest.

MANUFACTURING.

Iron and Steel.

The Cleveland Rolling Mill Company, Cleveland, Ohio, announce that their concern have not made any reductions in wages and no notices about wages have been posted at their mills. The works of the firm are not being operated to their full capacity. The plate mill is running, the angle and channel iron mill is going, the steel works are in operation and part of the wire mill is working. If wages are generally reduced this firm will be compelled to reduce also, as they cannot operate their mills and pay higher wages than are paid elsewhere. Their workmen have shown a disposition to accept any reductions that may be necessary in order to keep the mills running.

At the annual meeting of stockholders of the Belfont Iron Works Company, Ironton, Ohio, held recently, the old officers and directors were re-elected, with the exception that Geo. Williard, director, was replaced by the election of H. C. Burr.

The Britton Rolling Mill Company of Cleveland, Ohio, have decided to go ahead with the erection of a number of sheet mills projected last year. It is expected that two additional mills will be ready for operation within a short time, the bed plates, housing and other equipment having been secured some time since and are ready to put in position at any time.

The plant of the Monongahela Iron & Steel Company at Hays Station, a few miles from Pittsburgh, was put in operation on Monday, the 31st ult. This plant has an annual capacity of 15,000 net tons of muck bars, and contains twenty single puddling furnaces and one train of rolls.

Moorhead Brothers & Co. of Pittsburgh, operating the Vesuvius Iron & Nail Works, at Sharpsburg, will probably close the puddling department of their plant at an early date. The principal output of the firm is skelp iron, and the light demand for this product is given as the reason for the firm taking this step.

The Pittsburgh Wire Company of Pittsburgh, with works at Braddock, Pa., manufacturers of plain wire, have closed their plant down for an indefinite period on account of scarcity of orders.

In all probability the National Rolling Mills of the National Tube Works Company, McKeesport, Pa., will resume operations during this week. For some years this concern have not signed the Amalgamated Association scale, but have always paid wages called for by that scale, and it is probable that operations will be resumed this year with the same understanding.

Notice has been given that the Allegheny Steel Company of Pittsburgh, a corporation formed under the Act of 1874, intend to apply on August 17, 1893, for an amendment to their charter changing their name to "A. M. Byers & Co.," by which name they shall hereafter be known and designated.

The Junction Iron Company, Mingo Junction, Ohio, have reduced wages of employees of their blast furnace 10 per cent. The reduction went into effect on Sunday the 30th ult.

Receiver Sheldon of the Fort Payne Coal & Iron Company, Fort Payne, Ala., has ordered a sale of the property of the company. The terms and date of sale have not been fixed yet.

Furnaces A, B and C at the Edgar Thomson works, Bessemer, Pa., have been blown out and will remain idle for an indefinite period on account of the serious depression in business. The two Lucy Furnaces, at Pittsburgh, operated by the same firm, have also been banked down and will be idle for an indefinite period. The closing down of these five furnaces throws hundreds of men out of employment, and takes out of the market over 10,000 tons of pig iron per week. At the Edgar Thomson Steel Works, Bessemer, Pa., operations are being largely restricted, and a very large force of men have been laid off until there is an improved demand for rails. Early in the year it was the custom to turn the Edgar Thomson Steel Works on billets when orders for rails were scarce, but owing to the very light demand for billets this step will not be taken now, as with the Duquesne Steel Works in operation there is no difficulty in the firm meeting all the demands made upon them for steel. In addition to this, restricted outputs at the Homestead Steel Works, and at the Upper and Lower Union Mills in Pittsburgh, coupled with the fact that the Beaver Falls mills are closed down in all departments, causes a very large decrease in the consumption of steel by the Carnegie interests.

At Pittsburgh last week answers were filed to the suit brought by Alonza P. Kennedy against Winfield S. Kennedy and Park Brothers & Company, Limited, of the Black Diamond Steel Works, to obtain possession of 24 shares of stock in the defendant company. The plaintiff claimed 12 shares of stock were transferred to him by his uncle, Winfield S. Kennedy. He was paid the dividends for a time, but afterward the company transferred the stock back to W. S. Kennedy. It was then increased to 24 shares. The company claim the stock never was transferred to the plaintiff on their books, but they paid him the interest by direction of W. S. Kennedy. The latter states he sold the stock to A. P. Kennedy, who gave him notes in payment. He could not pay the notes when due, and the stock was retained by W. S. Kennedy, who had been holding it as collateral security.

John B. Knox, representing the bondholders, purchased the plant of the Woodstock Iron Company, Anniston, Ala., at the commissioner's sale, July 22. The property includes four furnaces and 50,000 acres of land. The bonded indebtedness is $1,000,000. The bondholders bought the property in for $400,000. The receivers are selling off the stock of iron to pay the $50,000 of debt incurred by the old company. It is stated that a new company will be organized and that a proposition will be made to the former stockholders by which they can come in, thus reducing their losses. The property is very valuable, and under proper management should prove profitable.

At Bessemer, Ala., furnaces Nos. 3 and 4 of the Tennessee Coal, Iron & Railway Company, which were blown out some time since for repairs, have gone into blast again. All five of the furnaces at this point are now in operation.

The work on the new furnaces at Rockwood, Tenn., is progressing rapidly. Two large blowing engines are being put in and the boilers are about all in place.

After running one full week, since the annual shut down for inventory and repairs, the employees of the Cambridge Iron & Steel Company, Cambridge, Ohio, numbering nearly 200, were notified last Saturday morning that the works would only be operated, on special orders, one or two days a week for the present. Plenty of orders are offered the company, who enjoy a good reputation for the excellence of their product, which consists of iron and steel sheets, but they are not willing to operate their plant for the benefit of customers who wish to buy on extended credit at a time when it is next to impossible to realize on commercial paper and meet the inevitable pay-roll. This concern have been in continuous operation during their four years' existence, excepting short intervals for repairs and inventory. All the industries at Cambridge are now at a standstill.

The Scottdale Iron & Steel Company, Scottdale, Pa., have completed repairs and their plant started full capacity July 31. They will run on specifications to complete contracts made prior to July 1, there being very little new business in sight upon satisfactory terms.

Dull times and a tight money market have caused the Guernsey Rolling Mill Company to indefinitely suspend their project to build new sheet mills at Cambridge, Ohio, for which purpose the company were organized.

The Whitaker Iron Company, Wheeling, W. Va., are operating their sheet mills and galvanizing shops to full capacity. There is no talk of a shut down and prospects are said to be good for a steady run.

It was stated a few weeks since that the Joliet Sheet Steel Rolling Mill Company, Joliet, Ill., were preparing to resume operations at their plant. The matter has since been reconsidered by the management and they have decided to allow the works to remain idle for the present. Quite a number of workmen who went to Joliet, expecting employment with this concern, are now without means of support.

It is stated that the order to shut down the Colebrook furnaces at Lebanon, Pa., has been recalled. They will be continued in blast, orders having been received to that effect.

It is stated that the East Lebanon, Pa., Rolling Mill Company will shortly com

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mence to rebuild the plant last winter destroyed by fire, the insurance having been adjusted satisfactorily.

The labor troubles with which the Ohio Iron Company, Zanesville, Ohio, have had to contend for a year or more appear to be at an end. Two small mills are running steadily and it is expected that the bar and guide mills will soon be in operation. Their furnace remains out of blast.

At Bridgeport, Ohio, work has been entirely suspended at the plant of the Ætna-Standard Company. No extensive repairs are being made, as is usual at this time of the year. No information can be had concerning prospects for resumption of operations.

The Jenifer Iron Company, which have an iron furnace and other iron property at Jenifer, Ala., near Anniston, have gone into the hands of a receiver on petition of John B. Know, representing J. H. Parker & Co., and other creditors. The liabilities of the company are estimated at about $100,000 and the assets are said to be considerably in excess of this amount. John E. Ware of Anniston is receiver.

The McCullough Iron Works, at Northeast, Md., which have been shut down for some time, will, it is stated, start up again at an early date. During the shut down two annealing furnaces were installed by Wm. Swindell & Bros., the engineers and contractors of Pittsburgh, and when the works resume operations they will be able to turn out both galvanized and black sheets.

The South Milwaukee Malleable Iron Company of South Milwaukee, Wis , have suffered a loss of $25,000 through the burning of their plant. They will rebuild. The new works of the Bucyrus Steam Shovel & Dredge Company, adjoining the burned works, were in great danger, but were saved through the brilliant work of the Fire Department.

At a special meeting of the stockholders of the Bethlehem Iron Company, held in Bethlehem, Pa., on Wednesday, the 26th ult., for the purpose of voting for or against an increase of the bonded indebtedness, 69,804 shares, all represented, voted for the increase.

Furnace No. 8 of the Thomas Iron Company, at Lock Ridge, Pa., has been blown out for repairs, and stack No. 7 has been started up. The latter furnace has undergone thorough repairs and additions to equipment.

The 119-inch mill at the Homestead Steel Works, at Homestead, Pa., which heretofore has been operated three turns of eight hours each, has gone on single turn, owing to lack of orders. It is also intimated that the Edgar Thomson Steel Works, at Bessemer, Pa., will be closed down soon on account of dullness of trade.

The plant of the Riverside Steel & Iron Company, Wheeling, W. Va., has closed down indefinitely, on account of the depressed state of trade.

The skilled men in the tube and bending departments of the Tyler Tube & Pipe Company, Washington, Pa., have struck rather than accept a reduction in wages.

In common with most of the factories in Bridgeport, Conn., the Wilmot & Hobbs Mfg. Company have concluded to reduce their force and run shorter time than usual. With this end in view, they have discharged about half of their force and will for the present run eight hours a day for five days a week. The company have a large number of orders on hand, but owing to the general stagnation in business deferred shipments have been requested and acceded to.

The Washburn & Moen Mfg. Company of Worcester, Mass., have made a reduction in their working force equivalent to laying off 800 men.

The blast furnace employees of the Jefferson Iron Company, at Mingo Junction, Ohio, have been notified of a 10 per cent. reduction in wages.

A receiver has been appointed for the Avery Stamping Company of Cleveland, Ohio, on the application of the Junction Iron Company of Steubenville. The total assets are estimated at $400,000 and the liabilities about $300,000. The amount of the Junction Iron Company's claim is $36,411.46 for iron and steel furnished, and, while the company are perfectly solvent, the appointment of a receiver was consented to by the Avery Stamping Company, in order to avoid being compelled to make an assignment.

At Braddock, Pa., the Carrie Furnace Company have suspended 60 metal carriers, while 100 men were thrown out of work by the suspension at the galvanizing department at the Braddock wire mill

The steel works of the Colorado Fuel & Iron Company, South Pueble, Colo., have closed down for repairs.

The four open-hearth furnaces of the Spang Steel & Iron Company of Sharpsburg, Pa., have closed down for an indefinite period on account of the lack of orders.

The Slatington, Pa., Rolling Mill, after being thoroughly repaired, has resumed operations.

Recently some wild rumors have been in circulation concerning the Oxford Iron & Nail Company of Oxford, N. J., the reports even going so far as to say that the company had gone into the hands of receivers. These reports were entirely without foundation, and have been the cause of considerable annoyance to the company. In accordance with their usual practice the nail mill was closed down on July 1 and has not yet resumed, owing to the general stagnation in the iron trade. Under these circumstances, as the product of the furnace is nearly all consumed by the nail mill, very little being sold in the open market, the running of the furnace and mines was not profitable, and the employees were advised that a suspension of operations for a time at least would be necessary. Rather than be thrown out of employment entirely, the men proposed that they accept a reduction in wages and the mines and furnace be continued in operation. This arrangement has been agreed to by the company and the men will remain at work. Whenever trade conditions warrant the resumption of work on the part of the nail mill it is expected that a return will be made to the old basis of wages.

Machinery.

The workmen employed on piece work at the shops of the Westinghouse Air Brake Company, Wilmerding, Pa., have been notified of a reduction in wages amounting to about 20 per cent. Heretofore the men have been making from $4 to $4.50 per day and the earnings will now be limited to a scale ranging from $3.25 to $3.50 per day. The piece workers have been averaging 960 pieces every two weeks, which, at 5 cents each, caused their earnings to amount to $48 for that period. Under the new scale of 4 cents they will be forced to complete 1050 pieces in order to average $42 every two weeks, or $3 50 per day. At the above works some 600 or 700 men have been suspended for an indefinite period until orders become more plentiful. Unless there is a revival in business it is probable that additional men will be suspended.

The Leechburg Foundry & Machine Company recently shipped to the Cumberland Steel & Tin Plate Company, at Cumberland, Md., a 20-inch tin mill, 36-inch doubling shear with engine attached, and one Mesta patent automatic pickling machine. The addition of this equipment will allow the latter named concern to more than double their present output.

The Detroit Foundry Equipment Company, Detroit, Mich., have opened a New York office at 182 Front street, in charge of J. Gilmour.

Watts Campbell Company of Newark, N. J., are completing a new foundry building which will be supplied with two Whiting cupolas, furnished by the Detroit Foundry Equipment Company of Detroit, Mich.

Announcement was made on July 27 that the iron foundry of S. S. Bent & Son, New York, and Port Chester, N. Y., had made an assignment to Everett N. Griswold. The business is an old one, having been founded in 1850 by the father of the present head of the concern. The general financial depression is given as the reason for suspension.

The large manufactory of the Buffalo Pump Works, at North Tonawanda, N. Y., has the main building of 80 x 200 feet. Adjoining this are two other buildings, each 55 feet square. The foundry is 80 x 175 feet, the storehouse 80 x 80 feet, and the pattern shop 40 x 80 feet in dimensions. Most of the machinery is now in the buildings, and the large cranes are already up. The entire plant will probably be in working order some time in August.

According to the *Electrical Review*, the General Electric Company have decided to shut down the iron foundry of the Thompson-Houston works, at Lynn, claiming that castings can be purchased of local foundries cheaper than the company can make them. The steel foundry is not to be shut down.

The annual meeting of the stockholders of the Westinghouse Machine Company, which was to have been held in Pittsburgh last week, has been postponed until September 6 next. It is stated that the showing of the firm for the year has been an unusually good one, the earnings amounting to about 18 per cent. of the capital stock.

The Howley Furnace Company of Chicago will probably locate a plant in Pittsburgh for the manufacture of their furnaces. A company called the Pennsylvania Down Draft Furnace Company have just been chartered under the laws of Illinois, with a capital stock of $300,000. Henry Vick, the mechanical engineer of the company, was in Pittsburgh last week for the double purpose of looking for a site for the plant and also to secure contract for furnaces. He has submitted propositions to the cities of Pittsburgh and Allegheny to put these furnaces in the water works of the two cities, and is said to have offered to build them for nothing and take pay in the amount saved by their use for five years.

The Lewis Foundry & Machine Company of Pittsburgh have ready for shipment a number of rolls 22 x 24 inches for the Whitaker Iron Works at Wheeling, W. Va.; also an 8-inch and 9-inch guide mill and a 14-inch merchant bar mill for shipment to a concern in the West.

At Pittsburgh, Samuel McCloy, attorney, who was auditor in the voluntary assignment of James P. Witherow to Alexander Thomas, has completed the work and will file his report in the prothonotary's office in Pittsburgh during this week. The total amount for distribution is $103,944 72, the preferred claims amounting to $2,748.06. The difference between these two sums will be distributed among the general creditors, who will receive a dividend of 37.6 per cent. of the amount of their claims. The indebtedness is $268,932.70. About 80 per cent. of the creditors accepted stock in the new James P. Witherow Company, while all those whose claims amounted to $300 and under will be paid in full, and the others who did not agree to take stock in the new company will receive only their pro rata share. The works of the James P. Witherow Company at New Castle, Pa., are now in partial operation, and all outstanding claims are to be collected and placed to the credit of the new company.

The Buss Machine Works of Benton Harbor, Mich., with offices in Grand Rapids, Mich., and Chicago, Ill., are completing some new wood-working machinery which will interest the trade at large.

The St. Joseph, Mich., Iron Works are about to place a new veneer-cutting machine upon the market for which Secretary Hatch promises much.

The Dayton Nut & Bolt Works, at Newport, Ky., have been purchased by John Trapp. It is understood that the purchase price was $50,000. The new owner will organize a stock company, improve and increase the capacity of the plant and put it in operation.

The Saginaw Mfg. Company, Saginaw, Mich., are making extensive improvements to their plant, including a new engine room and a large addition to their warehouse.

The Holly Mfg. Company of Lockport, N. Y., have not felt the effects of the hard times from which so many of our manufacturing concerns are suffering. The company now have on hand nearly $1,000,000 of work, and the shops will be tested to their greatest capacity for a good while to come. The contract recently secured from the city of Pittsburgh for two 10,000,000-gallon pumping engines, amounting to $180,000, is among the largest individual orders secured by the company.

The Logansport Mfg. Company of Logansport, Ind., have brought suit for $75,000 damages against the Wabash Railroad Company for the destruction of their plant by fire which they claimed resulted from a spark from a passing locomotive.

The Franklin Iron Company of Franklin, Mass., will remove their foundry to Milford, where the following buildings will be erected: Main building, 102 x 47 feet, one story, with monitor roof; office and pattern shop, 60 x 25 feet, two stories; shipping and packing shop, 20 x 50 feet, two stories; core shop, 20 x 20 feet, one story; shed, 20 x 30 feet, one story.

The Oswego Railway Spring Company's works, at Oswego, N. Y., are being considerably enlarged by the addition of a new building, 125 x 75 feet in size. The new

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building will be devoted to the manufacture of elliptical springs for locomotives, passenger and street cars, and when this department is completed and in use, about August 20, the entire plant will have a capacity of about 30 tons of springs per day.

The Roberts Mfg. Company of Pittsburgh, Pa., manufacturers of patent detachable steel link belting, sprocket wheels and shafting, have increased the capacity of their plant by the erection of a new building, 75 x 75 feet, and the introduction of new and improved machinery.

The Thomas-Roberts-Stevenson Company of Philadelphia, stove manufacturers, have contracted for the erection of a one-story brick foundry, 100 x 47 feet, and a three-story brick storage house, 33 x 66 feet, as an addition to their plant at Second and Mifflin streets.

The King Bridge Company of Cleveland, Ohio, have their new riveting shop well under way, and expect to have it completed and in operation within 60 days. The new building will be of brick and iron, as near fire proof as possible, and will give a clear space of 200 x 320 feet. The plant will be equipped with new and improved machinery.

By a recent fire in the McDougall Works, at Montreal, the pattern shop and upper machine shop were destroyed. The foundry proper and the lower machine shop were not seriously damaged. The insurance, $26,200, will cover the loss sustained.

The Bailey foundry, at Elkland, Pa., has been leased for a term of years to H. Longwell & Sons, who will manufacture a drill patented by the senior member of the firm.

The new American Line steamers now building at Cramps' yard, Philadelphia, will be fitted throughout with Worthington pumps, manufactured by Henry R. Worthington, New York. The order for the pumps also covers Worthington feed-water heaters such as are now used on some of the fastest transatlantic liners, among which are the "New York" and "Paris" of the American Line.

The Parker Machine Shop, at Clinton, Mass., has reduced its working time to nine hours a day and five days a week.

The Putnam Tool Company of Fitchburg, Mass., have closed their works. The Putnam Machine Works are running, however, and the uncompleted work of the tool company will be done there.

The Moore Mfg. & Foundry Company of Milwaukee, Wis., have suspended work at their shop, throwing 125 men out of employment.

The Industrial Works of Bay City, Mich. have closed down.

Prentice Brothers, manufacturers of machinists' tools at Worcester, Mass., have closed their shops for an indefinite period.

The Norton Emery Wheel Company, Worcester, Mass., have been forced to suspend their night gang owing to the falling off in orders.

The Port Huron Engine & Thresher Works at Port Huron, Mich., have laid off 75 of their force of 225 men.

The Eynon-Evans Mfg. Company of Fifteenth and Clearfield streets, Philadelphia, brass founders, &c., have recently supplied to the Midvale Steel Company four journal bearings weighing about 500 pounds each.

E Harrington, Son & Co. of Philadelphia, manufacturers of hoisting machinery, &c, have recently shipped several of their hoists to England, Panama and Mexico.

The strike at the boiler shop of the Cooke Locomotive Works, Paterson, N. J., is still on, and it is said that this department will close down as soon as the work under way is finished.

At Pittsburgh an opinion has been handed down sustaining the report of the Master in the case of Isaac W. Prank and Frank Kneeland against the Lewis Foundry & Machine Company (limited). The Master had recommended a decree for the dissolution of the company and the appointment of a receiver on the ground that the company had not been properly organized, and it was, therefore, not in fact a limited partnership association; also because of the dissensions between the members of the company. A decree in accordance with the Master's finding was directed to be entered.

A special meeting of the stockholders of the National Switch & Signal Company was held in South Easton, Pa., on Tuesday, the 25th ult., and it was decided to increase the capital stock of $100,000 to $400,000. It is stated that all suspended employees will be taken back again when the firm move their plant to Odenweldertown, Pa., and work is begun on the several large contracts now on hand.

Miscellaneous.

The King Bridge Company of Cleveland, Ohio, have received the contract for the erection of the Brooklyn-Brighton bridge to be built at Cleveland, Ohio. The contract price is given as $34,990.

The annual meeting of the stockholders of the Pittsburgh Brass Company was held in the offices of the firm in Allegheny, Pa., on Friday the 28th ult. The following directors were elected: Joseph McNaugher, Sr., W. F. Malloy, S. Schoyer, Jr., C. Bermingham, Joseph T. Arnold. W. W. Munhall and E. A. Kitzmiller. The usual 6 per cent. dividend was declared.

An execution for $6163 was filed last week against Jno. McDermott & Son of Pittsburgh, doing business in that city as the Iron City Refining & Smelting Company. The cause of the embarrassment of the firm is said to be due to the shut down of the silver mines in the West and the stringency in the money market, this being followed by a decrease of lead production and shipments. The liabilities of the firm are $12,000, with assets of the same amount.

The Ducktown Sulphur, Copper & Iron Company, Ducktown, Tenn., are running their 100-ton furnace both day and night and it makes 60 per cent net. They have stopped shipping iron ore for the present. The Burr-Burr Company, at the same place, will resume work in October.

The Franklin Brass & Bronze Company, whose headquarters are in New York, have made arrangements to build a plant at Birmingham, Ct. The company will manufacture light brass and bronze hardware and ornamental trimmings, and will employ 75 men at the start.

The assignee of the Fostoria Brass & Iron Works, at Fostoria, Ohio, has made his report setting forth that the assets are $147,-694 and liabilities $191,400. It is said that a settlement with the creditors will probably be effected and the works allowed to resume.

The Jackson & Woodin Mfg. Company, Berwick, Pa., have just completed a new car wheel plant supplied with the Whiting system of cupolas by the Detroit Foundry Equipment Company, Detroit, Mich.

The Springfield Brass Company of Springfield, Mass, lose $10,000 by a fire which recently damaged their stock. The business of the company will not be seriously affected.

The new shops of the Great Northern Railroad, at Spokane, Wash., which have been in course of erection for several months, have been completed. The cost of the shops has been $350,000.

The Comins Mfg. Company of Upper Sandusky, Ohio, have laid off the greater portion of their force. Several orders placed with the company some time since have been canceled owing to the tightness of money.

A dispatch from Philadelphia says that it is reported that the Baldwin Locomotive Works will shortly discharge 500 men owing to the action of some railroads in canceling orders for locomotives.

The Arcade File Works of Anderson, Ind., have closed their plant to make general repairs and increase the capacity. The company are crowded with orders, and report business up to the usual standard.

The Coe Brass Mfg. Company of Torrington, Conn., are running their works four days a week.

A large number of men have been laid off at the works of the Peck Stow & Wilcox Company, Southington, Conn.

The Eddy Mfg. Company of Windsor, Conn., makers of electro-dynamos, motors, generators and electrical supplies, will run eight hours a day and five days a week until further notice.

The Craighead & Kintz Mfg. Company, at Ballardvale, Mass., have shut down their works for an indefinite period. The Company have a large stock and their business is suffering from the depressed condition of trade.

John B. Harker & Co., manufacturers of waffle irons, &c., at Minneapolis, Minn., have gone into receivers' hands.

The National Cash Register Company of Dayton, Ohio, have shut down their works. Nearly 1200 hands are usually employed at these works.

The Barney & Smith Mfg. Company of Dayton, Ohio, which usually employ from 1700 to 1900 men, have reduced their force to 700.

The Lynn, Mass., works of the Thomson-Houston Company are to run but five days a week until further notice.

The Hausmann Art Metal Company of Niagara Falls, N. Y., have been working night and day recently, getting out their Columbian plaques, and are now producing a bronze medallion of the President and Mrs. Cleveland in oval form.

General Manager John Kruesi of the Edison General Electric Company, Schenectady, N. Y., says that the works will not be shut down, as reported. The amount of production has only been reduced for the time being. There is not the slightest intention of shutting down the works, as there are a number of orders on hand which must be filled.

Trade Publications.

THE LUKENS IRON & STEEL COMPANY of Coatesville, Pa., have issued in a very neat form a code book for the convenience of their customers. It contains a table showing the sizes of plates and heads rolled by the company and gives directions for ordering flange work, prices for flange heads and flue holes, and a very well prepared compilation of information likely to be of use to boiler makers and others who are consumers of plates. They give the weights of plates, of rounds and squares, the number of rivets in 100 pounds, the capacity in gallons of cisterns and tanks and describe the Huston patent boiler brace. Then follows, well classified, the code itself.

THE E. W. BLISS COMPANY of Brooklyn have printed in handsome form a series of catalogues of their presses and drop hammers in three languages, so as to enable foreigners conversant with the German and French languages to appreciate the merits of their machinery.

THE GOULDS MFG. COMPANY of Seneca Falls, N. Y., have issued special addenda to their catalogue of Power Pumps. Since the issue of the catalogue referred to the company have brought out a new line of Triplex Hydraulic Pressure Pumps, another line of Triplex Ammonia Pumps and have also made several improvements in the design and construction of their other Triplex Power Pumps, notably in the connecting rods and crank bearings, the bases, valves and valve chambers, all of which are illustrated and described in the addenda. Directions are also given for placing and operating Pumps. The closing pages of the pamphlet are devoted to testimonials from concerns using the company's Pumps.

Charles C. Lockstaedt, a mechanical and electrical engineer recently residing in Chicago, is missing, with charges of forgery and obtaining money under false pretenses against him. He is said to have raised above $100,000 by forging notes of the Westinghouse Electric Company, which were negotiated at different Chicago banks. He was the originator of the Chicago Pulley and Hanger Company, and is said to have stocked the shop with machinery unpaid for but used merely as a cloak to give him business standing in the negotiation of the forged notes. It will be recalled that Lockstaedt was the lowest bidder for electric lighting at the World's Fair, through whose instrumentality the Edison Company were defeated in endeavoring to get a much higher price.

The Canadian Sault Ste. Marie Canal will be ready for traffic by May 1 next year, according to an announcement made by the Canadian Minister of Railways and Canals.

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TRADE REPORT

Stagnation prevails in all the leading markets and in all branches of the Iron trade. Very few plants throughout the country are running anywhere near full capacity and restriction of output or complete closing down is the order of the day. Consumption of raw and finished goods is at a low ebb, a good many orders have been canceled, and in many instances delivery of goods is withheld until it becomes quite clear that prompt payment is forthcoming.

The one danger feared is that the financial stringency, which has until now been confined to the wholesale trade and to manufacturers, will spread to the retailers throughout the country. The discharge of many thousands of men will restrict sales and will put pressure for credit upon the small merchants.

A somewhat sensational sale of Pig Iron has taken place in the Shenango Valley, where about 22,000 tons, at three furnaces, were sold at auction. Our Pittsburgh correspondent gives the details concerning the sale of 13,000 tons of this Iron at the Douglass furnaces. This is known as Schlesinger Iron and the bulk of it was bought in by Corrigan, Ives & Co. There seems to be some doubt as to the title on the metal. The prices, $5.30 @ $6.15 for Gray Forge, $7.05 for No. 2 and $8.95 for No. 1 Foundry, are extraordinary. Some of it may be offered to consumers at pretty low figures in the near future.

From Chicago come reports that some buyers are willing to cover requirements, but their views are very low and no business has resulted.

In Bessemer Pig there are reports from Philadelphia that some Cornwall Pig has been seeking buyers at unprecedentedly low prices.

Evidences of pressure are cropping up among Southern furnaces, $8.25 for No. 2 being named. It should be noted, however, that the quantities involved are small thus far.

The first intimation that the stoppage of so many mills in the West is telling comes from Chicago, where a slightly firmer feeling has developed in small lots of Bars.

All the metals are dull, and are weaker, cash Tin selling at 18.65¢, and Lake Copper at 10⅛¢, with reports of transactions at 10¢.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., August 1, 1893.

The situation in Iron and Steel remains in the same depressed condition as noted in our last. Absolute stagnation seems to prevail in all departments, and so far as can be seen is likely to continue indefinitely. All large work is relegated to the rear, while small work is not by any means what it was some time ago. It is difficult to give a satisfactory explanation of the why and the wherefore, but as a disagreeable and existing fact it admits of no dispute. Neither is it an easy matter to say how soon or how long before the inevitable reaction comes. Trade is paralyzed, and that is about all that is known as a certainty. To talk of improvement at a time when mills are shutting down in every direction would be an absurdity; the important question is, Where will it all end? The answer to this must be the general one that applies to all similar experiences—viz., that after a period of depression will come one of renewed prosperity. Meanwhile, there has been and must be a weeding out of weak concerns, further reduction in cost of production, a general cleaning up of stocks, and then business will begin to resume its normal condition. There is reason to fear that the fall and winter months will be marked by serious depression, as for the time being there is an entire absence of anything likely to develop a reaction. A multiplicity of influences have combined to bring about the present condition of affairs and the remedy must come in the same way. Legislation can do very little toward bringing immediate relief, but it is hoped that what is done will tend to allay the anxiety and apprehension, which is largely responsible for the conditions which now prevail.

Pig Iron.—The market is extremely dull, price being no inducement except to those who need material. The fact that furnace owners anticipated the falling off in demand by curtailing production has so far prevented anything like demoralization, but recent developments show that they were none too soon in their action, and even with a greatly reduced output it is difficult to find buyers for all the Iron that is on the market. It cannot be said that there is any extraordinary pressure to realize (and if there were it would not help matters), but there is full and plenty, and buyers with money in their hands can get almost anything they want at concessions from quoted rates. But money is scarce, even with the best concerns, so that the bulk of the business is in small lots, and in most cases at about the figures quoted herewith. The feeling in regard to the immediate future is not hopeful, and while prices are very low and not likely to go much lower under any circumstances, yet the purchasing power is also at a low ebb, and bids for large lots seldom met with. It is possible that buyers could be found at a price, but it would be more like buying money than selling Iron, consequently things are allowed to drift along until something transpires to indicate that a change is at hand, either for better or worse. Meanwhile, we regret to say, there is nothing in the situation to-day that promises very early improvement, but, on the other hand, it is hardly possible to reach lower depths of depression, so that the only alternative is to hope that the end is nearer than we are apt to imagine. Quotations for Philadelphia and near-by points are about as follows:

American Scotch, No. 1X...	$16.00	@	...
American Scotch, No. 2X...	15.00	@	.....
Standard Penna. (Lake Ore), No. 1x.	14.75	@	$15.25
Standard Penna. (Lake Ore), No. 2x.....	14.00	@	14.50
Standard Virginia, No. 1x...	14.50	@	14.75
Standard Virginia, No. 2x..	13.75	@	14.25
Virginia and Southern, No. 1x, Soft.....	14.25	@	14.50
Virginia and Southern, No. 2x, Soft.....	13.50	@	13.75
Standard Penna. and Virginia Forge.....	13.00	@	13.25
Ordinary Forge.....	12.50	@	12.75

Bessemer and Low Phosphorus Iron.—There is very little business doing, and, for that matter, very little Iron for sale. Prices are nominally about $16, delivered, for Standard Bessemer, and $18 for Low Phosphorus, but all depends on circumstances. Any one needing a small lot of Iron would have to pay full prices, but, on the other hand, any pressure to sell would just as certainly lead to lower figures. The market is so narrow that a difference of 25¢ @ 50¢ ℔ ton could easily be made, and without doing much business either.

Steel Billets.—There is not much of a market, consequently prices can easily be moved, according to which side is most anxious to do business. Buyers needing a few carloads of special sizes or quality would probably have to pay $24, delivered, or more than that, while any attempt to sell a round lot of ordinary Soft Steel would be just as likely to force prices below $23. The truth of the matter is that there is no market, each and every transaction being subject to special negotiation, particularly as to deliveries and payments, the latter being a more essential feature than ever before.

Steel Rails—Extremely dull, and with no prospect of improvement unless the money market becomes very much easier. The same remarks apply to Girder Rails, which are materially affected by the condition of the money market.

Muck Bars—Nothing doing, sellers ask from $22.50 to $23, delivered.

Merchant Bars.—Business is very quiet, and only the best managed concerns, and those with the best connections, manage to run from one-half to two thirds time. There are no large orders around, and the small trade is competed for in a way that keeps prices very close to first cost. Nominal prices are from 1.60¢ to 1.65¢ for Best Iron, city deliveries, and 1.50¢ @ 1.55¢ at interior points, with common qualities as low as 1.40¢ @ 1.45¢.

Skelp.—Nothing doing, although for the right kind of an order there would be no difficulty in placing it at 1⅛¢ delivered for Grooved, and about 1.60¢ for Sheared.

Plates.—There is probably as much business being done as could be fairly expected, considering the general situation; but taking the most hopeful view, there is little to be said in the way of encouragement. There are no large orders whatever, while the small ones are taken at prices which have little or nothing in the way of margin for the manufacturer. It is difficult to quote with anything like exactness, as price depends altogether on what may be wanted, how paid for and other considerations peculiar to each individual transaction. Nominal prices are about as follows, but on fair-sized lots, with satisfactory settlements, liberal con-

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cessions can be had from the following list:

	Iron.	Steel.
Tank Plates	1.80 @ 1.85¢	1.70 @ 1.75¢
Bridge Plates	.....	1.75 @ 1.80¢
Shell	.....	2.00 @ 2.15¢
Flange	2.70 @ 2.90¢	2.20 @ 2.40¢
Fire Box	3.00 @ 4.00¢	2.50 @ 2.70¢
Special qualities	.....	3.25 @ 3.75¢

Structural Material.—New business is confined to the smallest kind of orders, there being nothing offering of any importance. Some of the mills are doing fairly on old contracts, but these are approaching completion, so that there is only a poor prospect for work during the fall and winter months. Small lots command about the following prices, but on fair sized orders very material concessions could be had: Beams, Channels or Tees, 1.80¢ @ 2¢, according to size of order; Angles, 1.75¢ @ 1.80¢; Universal Plates, 1.70¢ @ 1.75¢.

Sheets.—Considering the general depression the demand for Sheets is very fair, but at most unsatisfactory prices. Common qualities can be had at extremely low figures, but on best makes in small lots, quotations are about as follows:

Best Refined, Nos. 14 to 20....2.75¢ @ 2.85¢
Best Refined, Nos. 21 to 24....2.90¢ @ 3.00¢
Best Refined, Nos. 25 to 26....3.15¢ @ 3.20¢
Best Refined, No. 27.....3.30¢ @ 3.40¢
Best Refined, No. 28.....3.40¢ @ 3 50¢
Common, ¼¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being ⅛¢ @ ¼¢ lower than above named:

Best Soft Steel, Nos. 14 to 16...2½¢ @ 2⅝¢
Best Soft Steel, Nos. 18 to 20.. 2⅞¢ @ 3¢
Best Soft Steel, Nos. 21 to 24...3⅛¢ @ 3¼¢
Best Soft Steel, Nos. 25 to 26...3⅜¢ @ 3⅝¢
Best Soft Steel, Nos. 27 to 28...3⅝¢ @ 3⅞¢
Best Bloom Sheets, ¼¢ extra over the above prices.
Best Bloom, Galvanized, dis.....70 and 5% @ 70 and 10%

Old Material—The general situation is essentially the same as last week, some little demand, and for spot cash very low prices, but for sales on the usual terms quotations are about: Old Iron Rails, $16 @ $16.50, delivered; Old Street Rails, $18 @ $19; Old Steel Rails, $13.50 @ $14.50; No. 1 Railroad Scrap, $13 @ $14, delivered; $7.50 @ $8 for clean new No. 2 Light Scrap; $11 @ $12 for Machinery Scrap; $11 @ $11.50 for Wrought Turnings; $7 for Cast Borings, and nominally $20 for Old Fish Plates, and $13 for Old Car Wheels.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, August 2, 1893.

The volume of business in Pig Iron is much restricted. There is little more than a single car lot demand in this district, and the demand from the East and the Northwest for Southern Iron has fallen off so that the sales for the week are smaller than they have been any week this season. A further reduction in the output is reported this week, but there is an ample supply of Pig Iron offered for the wants of the trade, for nearly all of the consumers of Iron have greatly curtailed their operations. The Iron Pipe works here are melting considerable Iron, but are not running to the full extent of their capacity. What little demand there is for Pig Iron is mainly for foundry grades, and is freely furnished at the inside quotations, which are the same as a week ago. The financial stress is as great as ever. Men of undoubted solvency and business ability insist upon settlement by note, for they find it impossible to obtain any banking accommodations. Purchasers of Iron who have the ready money find needy furnaces who will sell Iron at such low prices that the regular trade will not attempt to compete with them; but these are exceptional cases. We quote as follows:

Foundry.

Southern Coke, No. 1	$12.75	@ $13.00
Southern Coke, No. 2	11.25	@ 11.50
Southern Coke No. 3	10.75	@ 11.00
Ohio Soft Stone Coal, No. 1	15.50	@ 16.00
Ohio Soft Stone Coal, No. 2	14.50	@ 14.75
Lake Superior Coke No. 1	15.00	@ 15.25
Lake Superior Coke No. 2	14.00	@ 14.25
Hanging Rock Charcoal, No. 1	18.50	@ 19.00
Hanging Rock Charcoal, No. 2	17.50	@ 18.00
Tennessee and Alabama Charcoal, No. 1	14.75	@ 15.00
Tennessee and Alabama Charcoal, No. 2	13.75	@ 14.00

Forge.

Gray Forge	10.25	@ 10.50
Mottled Coke	10.25	@ 10.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.75	@ 18.00
Lake Superior Car Wheel and Malleable	17.25	@ 17.50

St. Louis.

(By Telegraph.)

Office of *The Iron Age*, Bank of Commerce Building, ST. LOUIS, August 2, 1893.

Pig Iron.—There is absolutely nothing new to say concerning the Pig-Iron market. A repetition of last week's report would about fit to-day's market, except perhaps the total sales for the past week were a little larger. No. 1 Soft and No. 2 Soft Irons are offered at $8.25 and $7.75, f.o.b. cars Birmingham, respectively, and some sales have been made on this basis. As a rule, however, consumers are not in the market for any large quantity, and as many manufacturing establishments are closed down or running on half time, the demand will still continue to fall off. At the moment there is absolutely nothing in the immediate future to justify the purchase of Iron, and until the conditions at present prevailing show some considerable improvement, it is useless to look for a revival of business. For ordinary quantities we quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$13.00	@ $13.25
Southern Coke, No. 2 Foundry	11.75	@ 12.00
Southern Coke, No. 3 Foundry	11.00	@ 11.25
Southern Gray Forge	11.00	@ 11.25
Southern Car Wheel	18.00	@ 19.00
Lake Superior Car Wheel	16.75	@ 17.25
Ohio Softeners	15.75	@ 16.50
Missouri Charcoal, No. 1 Foundry	12.75	@ 13.25

Bar Iron.—The demand for Bar is light, and while prices are unchanged, they are subject to shading on desirable orders. Mills are either closed down or only running half time, and will continue to do so until the demand improves. The local car works are nearly all closed down, and this cuts off a large part of the consumptive demand. Mills quote 1.45¢ @ 1.47½¢, f.o.b. cars East St. Louis, according to the size of the order. Jobbers ask 1.60¢ for small lots from store.

Barb Wire.—There is no demand whatever, and orders are carefully scrutinized before they are filled. Carload orders never were so scarce, and when they are received they are filled only after rigorous investigation. Prices are unchanged, but in the absence of business are inclined to go lower. Mills quote $2 for carload lots of painted, but this is more or less of a nominal quotation.

Wire Nails.—The remarks concerning Barb Wire can also be applied to Wire Nails. No orders being received and prices gradually tending downward. Jobbers quote $1.60 for small lots, while $1.45 @ $1.50 is the general mill quotation in carload quantities.

Rails and Track Supplies.—No demand whatever for Steel Rails, even at the low prices at present quoted, which are $30.50 @ $31.50. Track supplies are also dull and negelected and are quoted as follows: Splice Bars, 1.70¢; Spikes, 2¢; Bolts, Square Nuts, 2.50¢; with Hexagon Nuts, 2.60¢. Old Rails are offered at $16.

Pig Lead.—The market broke from 3.25¢ to 3.05¢, and offerings are made to-day at the latter figure without much business resulting therefrom. The market is unusually flat, and the consumptive demand has dwindled down to almost nothing.

Spelter.—The demand for Spelter shows no improvement and prices are weaker in consequence. It is difficult to quote the market correctly, as all sorts of prices are reported. About 3.80¢ is a fair quotation, with the better grades selling, say, at 3.90¢. The early resumption of work in the Kansas coal district seems assured, and a lower market seems probable.

Boston.

Office of *The Iron Age*, 146 Franklin St., BOSTON, August 1 1893.

The feeling in the Iron trade is extremely conservative. Dealers are yet delivering considerable Iron, but this is in completion of former orders rather than new business. There is a complaint of a lack of new business, even more than is due the usual dullness of midsummer. Buildings in the process of erection are generally being completed, but no new buildings are being started. It is the extra cautious idea of everybody that is checking the development of new business

Pig Iron.—The Pig Iron market is very quiet. Deliveries are going on in the completion of former orders, but new orders are few. Some of the foundries are shortening production, through working fewer hours, and others are closing altogether, for a season. There is considerably more of this shutting down and curtailing production than belongs to the ordinary hot-weather season. But, on the other hand, prominent dealers say that the furnaces, especially in the South, are being put out of blast in sufficient number and capacity to offset the stopping of the foundries. The market on Pig Iron is little changed in quotation, the feeling among the furnace people being that prices are already too low. Southern Iron, ex-dock, in Boston, is quoted at: No. 1, $15 @ $15.50; No. 2, $14 @ $14.50; No. 3, $13 @ $14. Virginia Iron continues to sell in this market at $15.50 for No. 1, with No. 2 at $14.25 @ $14 50. These prices are also for Iron delivered in Boston. Pennsylvania Iron is nominally quoted at shipping port at: No. 1, $14.50 @ $15; No. 2, $13.50 @ $14; Gray Forge, $13 @ $13.50. Ohio Irons continue in some demand, with the market at $17 @ $17.50 for Iron delivered in Boston.

Bar Iron.—There is only a quiet request for Bar Iron. Machinists are shutting down, to some extent, for the

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reason that the mills and factories are stopping, and hence they are not buying Iron. It is a conservative movement, and doubtless will work itself out all right, but it is likely to make a dull Iron trade. In some cases the factories shut down will avail themselves of the opportunity to make repairs, and in such cases machinists will find a better trade. The New England rolling mills manage to keep busy. It is also reported that the Troy Iron & Steel Works are busy. Ordinary Old Material Bars are quoted at 1.60¢ @ 1.65¢ from mill; from store, 1.65¢ @ 1.70¢. Best Bars from puddled Iron are quotable at 1.80¢ @ 1.90¢ from mill; from store, 1.95¢ @ 2½¢. Norway and Swedish Iron is very steady, with the supply in store yet limited. The quotations on such Iron, from store, are $66 @ $70 ℔ ton for Bars and Shapes.

Building Iron. — The position of Building Iron is a very quiet one. As mentioned above, there is some call for Iron for the completion of jobs already begun, but there are very few orders for new jobs. The market is actually easier, and quotations on Iron from mill are reduced: Beams and Channels from mill, 1.85¢ @ 1.95¢; from store, 2¼¢ @ 2½¢; Tees, 2.10¢ @ 2¼¢ from mill; from store, 2.40¢ @ 2.60¢; Angles, 1.80¢ @ 1.90¢ from mill; from store, 2¼¢ @ 2 35¢.

Steel, Steel Plates and Steel Rails. Buyers are operating just as carefully in Steel as in other Iron products, and while quotations are nominally unchanged, yet it is certain that concessions are made for round lots: Bessemer Steel, 2¢ @ 2.10¢; Tire and Sleigh Shoe, 1.90¢ @ 2¢; Sheet, 2¼¢ @ 2¾¢; American Cast, 6½¢ @ 7¢; English Cast, 13½¢ @ 15¢; American Steel Rails, $29 at mill. There is a very quiet trade in Steel Rails. The big roads in New England are not buying. Steel Plates are still firm, though the mills have not near the orders they desire. Quotations are firm at: Tank, 1 80¢ @ 1.90¢; Shell, 1.85¢ @ 1.95¢; Refined, 2.05¢ @ 2.12½¢; Fire Box, 2¼¢ @ 2¾¢.

Nails.—The conservatism in other commercial affairs begins to be felt in the Nail trade, though dealers are not cutting prices, regarding prices already as very low. Cut Nails, both Iron and Steel, are quoted at $1.40 ℔ keg for large lots and at $1.45 @ $1.48 for small lots. Steel Wire Nails are also more quiet, with the market quoted at $1.55 @ $1 60 to the trade.

Pipes and Tubes.—The market on pipe is mentioned as very quiet. Waterworks are being suffered to go by this season, by reason of the financial outlook. The Pipe card is reported to be unchanged, though manufacturers are a little easier. Boiler Tubes are in rather small demand, with the market at: 3-inch and over, 67½ % off from list; 2¾-inch and under, 65 % off.

Scrap Iron.—Scrap Iron is in the hands of a few buyers, so far as it is marketed at all, and there are still fewer buyers for consumption. No 1 Wrought is quotable at 50¢ @ 55¢, the latter an extreme price. Old Horseshoes and best selections of equal sizes are quotable at 55¢ @ 60¢. Cast Machine Shop Scrap of first quality is worth 50¢ @ 55¢. Light Iron is very dull, with the market nominal at 30¢ @ 33¢. Cast Turnings are quoted at 25¢ @ 30¢. A sale of 20 tons is mentioned at 30¢, with the buyer ready to take another lot at the same figure, if the Turnings are as good as the first lot. Wrought Turnings are quoted at 30¢ @ 35¢.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street.
CHICAGO, August 2, 1893.

Pig Iron.—Inquiries for round lots of Southern Pig Iron have sprung up recently, and if they were all to be placed the volume of business would be remarkably good in that line. Buyers, however, seem to be looking for special bargains and will not pay present prices for future delivery. They have set their expectations at about a dollar below prices asked by representatives of the Southern companies. As matters now go, they are likely to be out of the market for some time, because so many furnaces are out of blast that manufacturers are not inclined to sacrifice the stock they have on hand. Purchasing is therefore confined to hand-to-mouth quantities, on which current prices are being paid. Local Coke is neglected and Lake Superior Charcoal has been without movement for some time. A better tone financially is reported along the Pig-Iron houses so far as collections are concerned. The percentage of renewals to total amount due on accounts now maturing is smaller than had been expected, and if the consumption would only increase the trade would soon again be in a fairly satisfactory condition. Shipments, however, are so extremely light and new business is so small that it amounts to almost a complete suspension of trade. We repeat quotations subject to concessions for prompt cars and immediate shipment.

Lake Superior Charcoal.....	$16.00	@	$16.25
Local Coke Foundry, No. 1...	13.50	@	14.00
Local Coke Foundry, No. 2...	12.75	@	13.00
Local Coke Foundry, No. 3...	12.50	@	12.75
Local Scotch.....	14.00	@	15.00
Ohio Strong Softeners.....	15.75	@	16.25
Southern Silvery, No. 1		@	14 50
Southern Silvery, No. 2		@	14.00
Southern Coke, No. 2.....	12.75	@	13.00
Southern Coke, No. 3	12.25	@	12.50
Southern, No. 1, Soft.....	12.65	@	13.00
Southern, No. 2, Soft.....	12.00	@	12.25
Southern Gray Forge	11.50	@	12.00
Tennessee Charcoal, No. 1...	16.50	@	17.00
Alabama Car Wheel.....		@	18.85
Coke Bessemer	14.50	@	15.00
Hocking Valley, No. 1	15 25	@	15.50
Jackson County Silvery.....	16.75	@	17.00

Bars.—Some further early contracts were placed during the past week for Bar Iron and Soft Steel Bars. A feature of the situation which seems to have some significance is the recent increase in the demand for small lots from large consumers. Stocks appear to be getting extremely light in all large establishments and so many mills are closed that shipments are not being made on contracts already placed, so that these concerns are obliged to go outside and pick up Iron wherever they can. They are thus in a fair way to use up the available stock in mill warehouses and in the hands of merchants. If the mills continue closed in August there will be such a cleaning up of stocks that the situation will be decidedly improved long before September 1. Prices have firmed up on small lots owing to this movement and quite a volume of business in that way is reported at 1.50¢, half extras, Chicago. Buyers of large lots, however, are able to place them at 1 42½¢ @ 1.45¢ Chicago. Soft Steel Bars are unchanged in prices, being steadily quoted at 1.65¢. Small lots from stock are selling at 1.70¢ @ 1.75¢ for Iron or Soft Steel. The statement is made on good authority that the East Chicago Iron & Steel Company will not be seriously affected by the failure of Parkhurst & Wilkinson, but that they are in a perfectly solvent condition.

Other Manufactured Iron and Stee — Business in Structural Material, Plates, Sheets and Merchant Steel has not been heavy since our last report, the movement being confined to small quantities only. Prices are unchanged on mill shipments, Chicago delivery, as follows: Beams, 1 80¢ @ 1.90¢; Tees, 1.95¢ @ 2.05¢; Angles and Universal Plates, 1.75¢ @ 1.80¢; Tank Steel, 1.75¢ @ 1.85¢; Shell Steel, 2 05¢ @ 2 15¢; Flange Steel, 2.20¢ @ 2.30¢; High Grade Fire Box, 2 75¢ @ 5¢; No. 27 Common Black Sheets, 2.90¢; Juniata, Galvanized Iron, 70 and 10% discount; Sheet Copper, 30 and 35% off according to quantity; Smooth Finished Machinery Steel, 1.90¢ @ 2¢; Open-Hearth Spring and Smooth Finished Tire, 2¢ @ 2.10¢; Iron Finished Tire, 1.70¢; Ordinary Tool Steel, 6¢ @ 7¢; Special Tool Steel at 12¢ and upward.

Rails and Track Supplies.—Nothing new has transpired in the Steel Rail trade. Orders are confined to small lots. Prices are unchanged at $30 @ $32, according to quantity. Track Fastenings are selling at 1.60¢ @ 1 65¢ for Splice Bars; 2.55¢ @ 2.60¢ for Track Bolts with Hexagon Nuts; and 1.85¢ @ 1.95¢ for Spikes.

Old Rails and Car Wheels.—The situation in Old Iron Rails is such that quotations are extremely difficult to obtain. Consumers are not in the market, but are only buying when absolute bargains are offered them. Holders are endeavoring to keep up prices and some of them have quite recently refused $16, but dealers regard this as an exceptionally high rate, and are inclined to think that if a lot was forced on the market it would hardly bring $15 Nominal quotations on Old Steel Rails are still $9 25 for short pieces and $13 for long lengths. Old Car Wheels are very dull with nominal quotations $14 @ $14.50.

Scrap.—We hear of no transactions whatever. The following are nominal quotations per net ton, which are continued in the absence of more definite information as to values: No. 1 Forge, $12; No. 1 Mill, $9; Sheet Iron, $5; Pipes and Flues, $7.75; Axles, $18; Horseshoes, $12; Fish Plates, $14 50; Spikes and Bolts, $12.50; Cast Borings, $5.25; Wrought Turnings, $7.25; Axle Turnings, $9; Heavy Cast, $10; Stove Plate, $8; Malleable Cast, $8; Mixed Steel, $9.50, gross ton; Leaf Steel, $16.

Metals.—Lake Copper continues to be quoted at 10.75¢ for carload lots and Casting Copper is nominal at 10.15¢, with concessions for spot cash. Spelter has fallen to 3.85¢.

T. S. Casey and George E. Day have united forces under the firm name of Casey & Day and will hereafter represent, as selling agents, the Riverside Iron Works of Wheeling, manufacturers of Steel Pipe; the Globe Roofing Company of Cincinnati, makers of Sheet-Metal Roofing, and the Newport Rolling Mill Company of Cincinnati, manufacturers of light Sheets. Mr. Casey has represented the Riverside Iron Works in Chicago for 17 years, while Mr. Day was manager of the Hazen Company of Cincinnati for 12 years, so that both are very widely known in the Western Iron and Hardware trades. Their offices will be located in suite 445 The Rookery, Chicago.

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Pittsburgh.

(*By Mail.*)

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, August 1, 1893.

While the situation has not shown any improvement in the past week, it cannot be said to be any worse, and some of the best-posted authorities in the trade believe that prices are about as low as they will go. It is not believed that if a straight reduction of, say, 25 % was made all along the line of Iron and Steel manufactures it would result in any more business being done. There is no complaint of prices being too high, it is simply the want of confidence in the future that has brought about the great depression in business circles everywhere. Once this confidence is restored we can look for a healthy revival in business, and one that will remain with us for a long time. For two months past there has been but little buying, while consumption, restricted of course, has been going right along, and this means that stocks of all kinds of goods are extremely light and must be liberally replenished at an early date. The above briefly expresses the views of the business situation and the prospects for the future of one of the largest and oldest Iron manufacturers in Pittsburgh, who has gone through more than one crisis in his extended business career. For the week under review the market did not present any new features. The sale of Pig Iron at the Douglass Furnaces at Sharpsville, Pa., at the lowest prices on record, are referred to elsewhere. There is a limited demand for Structural Material and Plates, while Steel is almost entirely neglected. Some of the Sheet mills that started during July have been compelled to close for lack of orders. Others have finished repairs and stock-taking, but have no orders, and will remain idle for some time yet. The Wire Rod, Wire Nail and Wire mills will remain closed during August, by agreement. Bars are extremely dull, although Pittsburgh has booked several good-sized contracts from Western Implement manufacturers. Prices show little change, there not being enough buying to test the market.

Pig Iron.—The event of the week was the sale of some 13,000 tons of Pig Iron, at the Douglass Furnace, at Sharpsville, nearly all of which was bought by Corrigan, Ives & Co. of Cleveland, Ohio. The following is a correct statement of the sales and prices realized: Three thousand tons of Gray Forge at $5.30, 3597 tons of Gray Forge at $6.15, 2951 tons of No. 1 Foundry at $8.95, and 2852 tons of No. 2 Foundry at $6.05. These prices are for the Iron as it is piled in the yards of the furnace at Sharpsville and do not include cost of loading on cars. The 3000 tons of Gray Forge at $5.30 were bought by a Pittsburgh interest, and it is hardly necessary to say that the prices are the lowest on record. It is stated that few in the trade knew that the Iron was to be sold or the attendance at the sale would have been larger and the bidding more spirited. It seems that a Milwaukee bank had advanced money on the Iron, but through some oversight the Iron was not removed and was seized by the sheriff and sold, and the bank will lose all the money advanced on it. During the past week furnaces A, B and C, at Braddock, and the two Lucys, in Pittsburgh, have been blown out, thus taking about 1500 tons of Iron per day out of the market. Production everywhere is being largely restricted, which is undoubtedly good policy and will favorably affect the situation. In addition to the above, one Carrie, Clinton and Soho are idle, while additional stacks will likely be blown out this month. Prices on Bessemer have receded slightly since our last report and a sale of 1000 tons of Bessemer on the basis of $12.75, Pittsburgh, is reported. Buying is about at a standstill, and cannot improve until there is more activity among the mills. We quote as follows:

Neutral Gray Forge	$11.75 @	$12.00,	cash.
All-Ore Mill	12.00 @	12.25	"
Bessemer Pig	12.85 @	13.00	"
No. 1 Foundry	13 25 @	13.50	"
No. 2 Foundry	12.25 @	12.50	"
Charcoal Foundry No. 1	17.00 @	18.00	"
Charcoal Foundry No. 2	16.50 @	17.00	"

Billets.—The Wire Rod, Wire Nail and Wiremills will remain closed during August, while nearly all the Sheet mills are closed. In addition there is no disposition being shown on the part of idle mills to resume, and, with this condition of affairs, it is hardly necessary to state that there is no demand for Steel. In the Pittsburgh district but one Steel plant is running, while in the Wheeling district they are all closed. Those concerns in the Wheeling district who signed the Amalgamated Association scale have agreed to accept the same scale signed by Jones & Laughlins, Limited, but, owing to its terms not being made known to the lodges in the Wheeling district, nothing has been done as yet looking to a settlement of the wage scales for another year. We are not advised of any transactions since our last report and quote the market at $20.75 @ $21, f.o.b. at maker's mill.

Bars.—In Pittsburgh nearly all the mills are closed, with the prospect of resumption not encouraging. At some of the mills repairs and stock taking have been completed and operations could be resumed to-morrow if there were sufficient orders on the books to warrant operations being resumed. However, there are not, and most of the idle mills will likely remain so until business improves. In the Mahoning Valley there is no change in the situation, the mills nearly all being idle and showing no hurry to get started. While a mill is closed the pay-roll does not have to be met every two weeks, while to start up means to take paper for probably 90 % of the sales and put it in the safe, as the banks will not discount it. Prices do not show any material change and we quote Steel Bars at 1.45¢ @ 1.50¢, Bar Iron extras. In the Mahoning Valley Bars are held at 1.40¢, half extras.

Structural Material.—There is a fair demand for small lots of Beams, but not sufficient to keep the mills fully employed. Bridge Material is also in fair demand, the low prices of material resulting in the displacement of Wood for Iron in very many cases. Prices are irregular, depending on the nature of the order. We quote as follows: Beams up to 15 inches, 1.50¢ @ 1.60¢, f.o.b. cars Pittsburgh; Angles and Universal Plates, 1.60¢ @ 1.70¢; Tees, 1.75¢ @ 1.85¢, and Z-Bars 1.60¢ @ 1.70¢.

Plates.—Orders are entirely for small lots, and production among the mills is being cut down right along. The 119-inch mill at Homestead has been put on single turn of 8 hours. There are no large orders in sight and prospects of an improvement either in demand or prices are not bright. Prices are ruling about as follows: Tank, 1.50¢ @ 1.60¢; Shell, 1.70¢ @ 1.80¢; Flange, 1.75¢ @ 2¢; Ordinary Fire Box, 2.25¢ @ 2.50¢; Special, 3¢ @ 3.50¢.

Muck Bars.—No sales reported since last week. We make nominal quotation of $21 50, f.o.b. cars, Pittsburgh.

Wire Rods.—The Rod mills are all closed down, and will remain idle during August. There is nothing doing, and we quote nominally at $27.50 @ $28, Pittsburgh.

Wire and Cut Nails.—The Wire-Nail manufacturers met in Pittsburgh on Wednesday, the 26th ult., and decided to prolong the shut down during August, as the present condition of the trade did not warrant operations being resumed. Some Wire Nails are selling from stock in small lots, and although the mills are closed orders of almost any size can be filled from stock. We quote Wire Nails at $1.35 base in carload lots, Pittsburgh or Cleveland, and $1.45 in less quantities. Cut Nails are in light demand, and may be quoted at $1.05 base, in carload lots.

Merchant Steel.—Pittsburgh has secured some fairly large contracts from Western implement makers, and others are in negotiation that may be closed this month. Prices continue low and contracts this year are based on lower prices than prevailed last year. Wage-scale negotiations between the Linden Steel Company and their employees have been temporarily suspended, but will probably be resumed at an early date. For ordinary business the following prices prevail: Open-Hearth Spring and Tire, 1.90¢ @ 2¢; Machinery, 1.90¢; Curved Sleigh Shoe, 2½¢; Flat Shaped and Sleigh Shoe, 1.90¢; Tool Steel, 5½¢ and upward, according to quality.

Pipes and Tubes.—The financial troubles of the American Tube & Iron Company are referred to elsewhere. The two plants of the concern, at Youngstown, Ohio, and Middletown, Pa., are now idle, but are expected to resume operations next week. Next to the National Tube Works Company this is the largest Pipe and Tube concern in the country. Trade continues very quiet, there being practically nothing doing, while prices are also irregular.

Wire.—The mills are largely idle, and very little business is going. The plant of the Pittsburgh Wire Company, at Braddock, is idle, undergoing repairs, but may start up next week. A new scale is being put in and other additions to equipment are being made. We quote Painted Galvanized Wire at $1.85 @ $1.90, and Four Point Galvanized at $2.25 @ $2.30, in carload lots. We quote Plain Wire at $1.60, in carload lots, and $1.70 in less quantities, for Nos. 9 to 13.

Sheets.—Trade is exceedingly quiet, and, while many of the mills have finished repairs and are ready to start, there is not enough business being offered to warrant the resumption of operations. A few concerns who started up after the settlement of the wage scale have again closed down, owing to a lack of orders. We quote Soft Steel Sheets as follows: No. 24, 2.40¢ @ 2 45¢; No. 26, 2.50¢ @ 2.55¢, and No. 27, 2.60¢ @ 2.65¢. Galvanized Sheets are ruling at about 70 and 10 %, with slight concessions for desirable lots.

Coke.—Production in the Connellsville region showed a slight increase week before last, but some of the product was stocked. The week ending Saturday, July 22, shows 10,189 ovens in blast and 7144 idle, with a total estimated production of 88,106 tons. Compared with the production of the previous week this was an increase of 134 tons. Connellsville Furnace Coke is

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now being offered at $1.25 in tons of 2000 pounds, f.o.b. cars in region. Foundry Coke is being offered at $1.50 to dealers and $1.65 to consumers.

Cleveland.

CLEVELAND, OHIO, July 31, 1893.

Although the business outlook has some spots of brightness, few of them are to be seen in the Iron market. The big office forces down in the Pig Iron and Iron Ore districts are apparently as busy as ever, but there is no information to be gleaned regarding transactions and but little encouragement given for better things to come. Local banking institutions are standing the strain remarkably well, as well as any city in the country. Many men are out of work, but not as many proportionately as in other large cities. In fact, Cleveland is believed to be in better shape to live through the financial storm than almost any other large city.

Iron Ore.—Inquiries received during the past few days indicate that furnacemen will buy moderately of Ore early in August, having reached the conclusion that by no possible combination of circumstances can prices go lower. The Escanaba rate is again down to 45¢ ℔ ton, while the vessel men receive only 60¢ ℔ ton for bringing Ore all the way from Ashland. With good Bessemer Ores to be bought at from $3.65 to $3 85, it would seem an opportune time to buy if the condition of the Pig Iron market gave purchasers the slightest excuse for adding to their supply of Ore. The inquiries received have been of the hesitating kind, suggestive of concessions that it would appear impossible to make. It is announced in some circles that even the early season orders—generally considered as merely preliminary purchases—are greater than the furnaces will require, and that no effort will be made to hurry the Ore along. Some of the best mines in the Vermillion district shut down during the past year. Ore is still coming down the lakes in fairly liberal quantities, but estimates of the season's shipments made by the most enthusiastic men do not presage an output of over 3,500,000 or 4,000,000 tons of Ore to be sent to lower Lake ports.

Pig Iron.—Although the market is extremely dull there are indications that something better may be expected later on. The almost entire cessation of Charcoal Iron production leads dealers to believe the inquiries now being received will be much more numerous in August. Foundry Irons are weaker than ever and promise to go still lower. Bessemer Irons are extremely dull. Quotations are nominally as follows:

Nos. 1 to 6 Lake Superior Charcoal	$15.75	@	$16.00
Nos. 1, 2 and 3 Bessemer, ℔ ton.	13	@	13.15
No. 1 Strong Foundry, ℔ ton..	13.50		
No. 2 Strong Foundry, ℔ ton..	12 75	@	13.00
No. 1 American Scotch, ℔ ton.			14.25
No. 2 American Scotch, ℔ ton.			13 25
Mahoning and Shenango Valley Neutral Mill Irons, ℔ ton.			12.00
Mahoning and Shenango Valley Red Short Mills, ℔ ton..			12.25

Nails.—Dealers quote Wire Nails at $1.55, in stock, or $1.35, f.o.b. cars Cleveland. The demand is light.

Muck Bars.—No business of consequence is reported and quotations may be nominally announced at $21.75 @ $22.

Scrap.—The market shows no signs of improvement. Cast Borings are still quoted at $5.25; No. 1 Forge at $12, and Wrought Trimmings at $7.25 @ 7.50.

Louisville.

LOUISVILLE, KY., July 29, 1893

There is nothing doing in Iron and it does not seem likely that there will be any special movement until there is a change in the money situation. A few lots for prompt cash are being offered under the market, but their tonnage, all told, does not amount to probably 2000 or 3000 tons; yet they have the effect of startling buyers, because the price at which the Iron was offered was unprecedentedly low and could not be met by any of the furnaces; same, however, is no criterion of the legitimate market, as the prices named purely represented the needs of a few speculators owning the iron. Car Wheel companies continue to shut down, and complain very much of the scarcity of work, and the prospects are that there will be no immediate revival of the Car interests, as it is a very difficult matter for the Car trusts to financier and to make payment for the Cars at the present time. No. 2 Foundry, basis $8 25 Birmingham, a lot of 500 tons—but probably no more than this on this basis—was offered on the market without takers. Same was for spot cash and represented no furnace. This was purely a speculative lot that was bought by parties several years back who wished to realize at the present moment. We quote for cash cars Louisville:

Southern Coke, No. 1 Foundry.	$12.75	@	$13.25
Southern Coke, No. 2 Foundry.	11.50	@	12.00
Southern Coke, No. 3 Foundry.	11.00	@	11.25
Southern Coke, Gray Forge....	10.50	@	10.75
Southern Charcoal, No. 1 Foundry.....	15.00	@	16.00
Southern Car Wheel.....	17.50	@	17.75
Spathite.....	11.50	@	12.50

Financial.

The last week in July will go down in the traditions of finance as one of the darkest on record. Failure after failure in almost every line of trade and commerce, money stringency, rapid shrinkage in the value of securities and general lack of confidence marked nearly every day, with but the faintest streaks of light interspersed. Calls for money from Boston, Philadelphia and Western points caused the daily outflow from New York banks of from $1,000,000 to $2,000,000 in currency, rendering the tightness of money still more emphatic. The closing of many manufacturing establishments has been the inevitable result of great shrinkage in orders and uncertainty regarding the future. Gloomy crop reports also contributed to check reviving hopes Under all these conditions it is nevertheless a fact that business has been on the whole well maintained, with little evidence of unsoundness. During the last day or two of the month, however, the panicky features almost disappeared and a revulsion of feeling set in, due mainly to large foreign purchases of securities and to the announcement that very considerable amounts of gold had been secured in London as well as from other foreign sources. With the advent of August the position has become more reassuring and a healthier feeling has asserted itself. It is confidently believed that the very worst is now over, and that although the improvement may be intermittent things will not again reach the depth touched last week. Meanwhile the accounts which come in of the widespread closing down of mills, shops and factories in the East in nearly all lines of manufacture show that the stringency is, if anything, more keenly felt than ever in this section. This condition will require considerable time to right itself. None of the bank and other failures of the past week have been of prime importance, except that which was reported on Tuesday evening and Wednesday from Chicago, where the collapse of the great pork deal involved the failure of John Cudahy, the American Packing Company, Wright & Haughey and other large operators in provisions and grain. In the opinion of H. O. Armour, the influence of these failures will, however, be probably confined to the West.

A reduction made on Monday in the Bank of England's price for American gold coin, and the special accommodation that certain of the Clearing House banks of this city are giving in the way of foreign exchange, together with the unusually low level of prices for breadstuffs and other food products, have greatly facilitated the ability of foreign bankers to secure gold in the London market. The amount secured from abroad within the past few days, and which is now on its way to this country, reaches nearly $9,000,000, and this inward movement is likely to continue for some time. On Tuesday and Wednes- $7,500,000 gold were withdrawn in London for shipment here. Some of the Chicago, Philadelphia and Boston financial institutions have also ordered gold in England. The acquisition of these large sums will, it is anticipated, give an easier tone to the market by increasing the national bank circulation. Meanwhile the hoarding of funds by corporations and timid capitalists, which has added so much to the general difficulty, may be overcome by the return in confidence. Toward the close of the last week the savings banks of New York and Brooklyn, by concerted action, adopted the rule for 30 and 60 days' notice for the withdrawal of deposits. This has effectually prevented any unreasoning runs on these institutions, and the example has been followed with good effect in similar banks at other centers. A plan for further increasing the circulation was developed on Tuesday, which, it is believed, will relieve the present scarcity of currency to an important extent. This is the transfer to the discount banks of this city from the savings banks of a large amount—probably $10,000,000 or $12,000,000—of government bonds, which can be issued as security for a new circulation.

Money on call to borrowers on stock collateral has fluctuated from 3 to 20 %, averaging 7 %, and closing Tuesday evening at 6 %, with a decidedly easier feeling. In time loans rates are altogether nominal, 6 % and a liberal commission being bid without much business. The supply is limited and the demand urgent, and those who have any money to put out can secure liberal rates. There is no market for mercantile paper, the banks quoting rates for choice receivables at 15 %. The weekly statement of the associated banks on Saturday was somewhat better than had been expected. It shows that the banks have lost $5,100,000 in lawful money and reduced their loans $2,700,000. Deposits were approximately $8,300,000 less than last week, the net result being a decrease in the reserve of $3,000,000. The Comptroller of the Currency made a statement at the end of last week with a view to correcting the erroneous ideas as to the recent bank failures. In this he shows that the total number of banks which have gone in the hands of the Comptroller since January 1, 1893, is 105, of which

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14 have already resumed and several more are expected to do likewise very shortly. Out of the 105 suspensions but 37 banks have gone into the hands of receivers, the balance either having reopened or being still in the hands of examiners, with strong prospects of opening. By geographical sections the failures are distributed as follows: New England States, 2; Eastern States, 2; Middle and Mississippi Valley States, 15; Northwestern States, 6; Western States, 55, and Southern States, 25. Out of the 335 national banks in New York only 2 have failed. The Comptroller says it is worthy of note that no national bank has failed in Boston, Brooklyn, Philadelphia, Pittsburgh, Baltimore, Washington, Buffalo, Minneapolis, Cincinnati, St. Louis, New Orleans, San Francisco, St. Paul and numerous other financial and commercial circles, and that but one has closed in New York, two in Chicago and one in Milwaukee.

The Clearing House Loan Committee issued during the last few days $3,850,000 more loan certificates, making the amount now outstanding $29,250,000, thus breaking all previous records. These lately-issued certificates, however, practically represent, it is said, some of the gold that has been ordered from London. Some moderately large exports of silver have been made during the week. Bar silver closed in London on Tuesday at 3/0 11/16d ℔ ounce, and in New York at 79¼¢. For the first time since the passage of the Sherman law the Treasury has in July failed to buy the full quota of 4,500,000 ounces of silver. The total purchases for the month were 2,384,000 ounces, or a little over half the regular amount. Foreign exchange is irregular and lower nominal rates for Sterling being $4.81 for 60 days and $4.82½ for demand, although actual business was done on Tuesday at from 1¢ to 1¼¢ less. Some cotton bills have been sold.

Exchange on New York at domestic centers: New Orleans—Commercial par, bank 150 premium. Charleston—Buying par, selling ⅛ premium. San Francisco—Sight, 20¢; telegraph, 30¢. Savannah—Buying, ⅛ discount; selling, par to ⅛ premium. Chicago—Unsalable at better than $10 discount. St. Louis—$4 discount asked. Boston—$1 @ $1.25 premium for cash, payable in Clearing House certificates.

In the stock market, after the announcement of the Erie receivership, the conditions bordered closely on a panic. Stocks broke sharply, the decline in some of the best-paying dividends being phenomenal. Even those which had held up firmly during the previous decline melted like snow under the attacks of the bears. One specialty, Evansville & Terre Haute, dropped 58 points in a few minutes. Some revulsion in speculative sentiment took place the following day, however, and stocks showed a moderate rise from the former figures. The feeling of distrust continued to the end of the week, causing fluctuations of a considerable character, which affected most of the industrials, and to a lesser extent the railway and coal stocks. The panicky feeling, however, was absent at the opening on Monday, although the entire list of stocks showed lower than on the same day of the previous week. Some considerable advances were experienced in the course of Monday and Tuesday, owing to large purchases by foreign investors and numerous purchases by small local investors. On Tuesday evening the market closed stronger, notwithstanding the unfavorable news from Chicago, owing to returning confidence and the oversold condition of most securities. Wednesday brought a further advance. The following list gives some of the principal changes in active stocks since July 27:

	July 27.		Aug. 2.
American Sugar Ref.	71½	to	71
Am. Sugar Ref. Pf.	71⅝	to	72⅛
Am. Tobacco	60	to	55
Am. Tobacco Pf.	82	to	76¾
Balt. & Ohio	59	to	60¾
Chicago Gas	48½	to	46¾
C. C. C. & St. L.	29	to	32½
Delaware & Hudson	111	to	111
Del., Lack. & W.	136	to	138¾
Evansville & T. H.	128	to	90
Genl. Electric	44¾	to	45
Illinois Central	89	to	92
L. E. & Western Pf.	54	to	57
Louis. N. A. & C.	11	to	10
Manhattan	109½	to	110⅞
Missouri Pacific	20	to	21¾
N. Y. Central	92¼	to	100⅛
Pullman Car	152⅛	to	140
U. S. Rubber Pf.	68	to	62½
Union Pacific	16½	to	20
Wheel. & L. E. Pf.	41	to	37½

The table presented below, illustrating the extent of losses in some of the more prominent stocks, will give a good idea of the phenomenal decline in values during the present year:

	High.	Low.	Dec.
American Cotton Oil	51¼	24	27¼
Am. Sugar	134¾	67	64¾
Am. Tobacco	121	54	67
Chicago Gas	94½	43½	51
Col. Fuel & Iron	72	20	52
Consol. Gas	144	110	34
Distilling & C. F.	66⅜	13¼	53⅛
Gen. Electric	114¼	40½	73¾
Nat. Cordage	75	9	64
National Lead	52⅛	20⅛	32
U. S. Rubber	68⅝	25	35⅝
Manhattan	174¾	100	74¾
Pullman	106	46¼	59¾
N. Y. Cent.	111½	92	19½
Erie	26⅝	7¾	18⅞
Lake Shore	134½	106	28½
Northwest	116⅜	84⅞	31½
Rock Island	89⅜	53	36⅜
St. Paul	83½	46½	37
Jersey Cent.	132¾	84	48¾
Lackawana	156½	130	26½
Union Pac.	42⅝	15¼	27⅜
West. Union	101	67⅛	33⅞
Pacific Mail	27½	9	18½

Government bonds are easier, the following quotations showing closing prices to Tuesday evening:

U. S. 4s, 1907, registered	108
U. S. 4s, 1907, coupon	108
U. S. 2s, registered	95½

Railroad bonds were active and irregular.

The week has seen the most intense excitement in the grain and provision markets. On Monday September wheat crashed down under a frantic and demoralized liquidation to 57¾¢ ℔ bushel in Chicago, while cash wheat was to be had at 53¾¢, these being the lowest prices the grain was ever sold for in Chicago. The market revived on Tuesday owing to heavy clearances at the seaboard and showed considerable advance, which was, however, lost later in the day on reports of several important failures in Chicago. Corn continues dull and featureless, showing the depression in wheat.

The Chicago provision market was completely demoralized on Tuesday by the collapse of the corner in pork, which involved the failure of half a dozen of the chief operators, as previously noted. September pork fell $7.25 ℔ barrel and other provisions accordingly, bringing down the artificial values which had been maintained by the manipulators since last March.

Cotton shows considerable decline from the strength recently displayed, a gross weakening of 15 to 16 points, owing mainly to better crop reports and bad financial conditions.

Metal Market.

Pig Tin.—There has been moderate fluctuation in prices, and the net result is that the market stands practically the same as it was a week ago. The exception is that sales of spot stock and deals in "futures" are harder to work in the face of an apparent reduction of 1600 tons in the visible supply on this side of the Atlantic during the past month, and data showing shipments of only 900 tons from the Straits during the last half of July, or a total of 2425 tons for the entire month, against 3500 tons in July last year. Monetary stringency has some weight as an offset to the McKinley duty and the 8300 tons in stock here, as per Metal Exchange records, is an obstacle of no mean description. In any event the heavy spot stock has thus far proved a stumbling block in the way of efforts to raise prices to a parity with present cost in foreign markets. At the close of the week values were irregular, with as low as 18.65¢ net cash quoted on spot stock and 18.80¢ for August, deliverd. The statistics of movement and supplies, as posted on the Metal Exchange, were as follows:

	July. Tons.	June. Tons.
Shipments:		
Straits to Great Britain	1,150	1,900
Straits to Continent Europe	1,200	1,025
Straits to United States	None	None
Total from Straits	2,350	2,925
Australia to Great Britain	300	380
Australia to United States	None	None
Total from Australia	300	380
London to United States	None	1,100
Holland to United States	None	140
Total from Europe	None	1,240
Consumption:		
London deliveries	2,050	1,550
Holland deliveries	370	700
United States, excl. Pacific ports	1,600	1,400
Total	4,020	3,650
Stocks, end of month:		
In London	2,022	1,807
In Holland	1,140	490
In United States, excl. Pacific ports	8,310	9,910
Total	11,472	12,207
Stocks afloat:		
For London	2,237	3,479
For Holland	1,220	1,600
For United States, excl. Pacific ports	None	None
Total afloat at the close of month	3,457	5,079

	Aug. 1, '93.	July 1, '93.
Total visible supply	14,929	17,286

Copper.—To all accounts, business has been quite as slow as it was during the week preceding the one under review and evidence is wanting of any increase in the demand. Naturally prices have softened and the market has shown additional signs of weakness. Still, producers hold against adverse conditions in remarkably good form, and, up to date, the decline appears more superficial than real. On the Metal Exchange there were offers to sell Lake Superior Ingot at 10¢ for delivery this month and next. It was rumored, also, that private sales, on regular terms, have been made at the same price, although 10⅛¢ @ 10¼¢ stand as the popular quotations. Electolytic Copper is quoted at 10¢ and common Casting stock at 9¾¢ upward, but other than small sales are difficult to make at those figures.

Pig Lead.—Business to a fair extent has been effected at 3.35¢, and the market is feverish, with rather weak undertone, suffering more or less from the financial situation and general de-

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pression in business circles. On large lots bids did not go beyond 3.25¢, and were remarkably few.

Spelter.—Free offering has failed to stimulate business in the slightest degree. Moderate sales seem to be about all that have been made, although sellers not only offered openly at 3.95¢, but solicited bids at 3.90¢ for ordinary Western brands for early shipment.

Antimony.—The market has remained dull and prices have undergone very little change. The prices quoted on round lots are 9¾¢ @ 9⅞¢ for Hallett's, 10⅛¢ @ 10¼¢ for L X, and 10⅜¢ @ 10½¢ for Cookson's.

Tin Plate.—There has been no improvement in the demand for spot stock or future deliveries and the market presents a dull appearance. Sellers' prices remain about as they were a week ago, but concessions have been the rule where anything in the nature of desirable orders was involved and the market is still weak as well as dull. Spot quotations are as follows: Coke Tins—Penlan grade, IC, 14 x 20, $5.30; J. B. grade, do., $5.40; Bessemer full weight, $5.35; light weights, $5 @ $5.02½ for 100 lb, $4.90 for 95 lb, $4.80 for 90 lb. Siemens Steel scarce. Stamping Plates — Bessemer Steel, Coke finish, IC basis, $5.60; Siemens Steel, IC basis, $5.65; IX basis, $6.75. Charcoals—Melyn grade, IC, $6.35 @ $6.37½; Crosses, $8; Allaway grade, IC, $5.60; Crosses, $6.80; Grange grade, IC, $5.70; Crosses, $6.85. Charcoal Ternes—Worcester, 14 x 20, $5.70; do., 20 x 28, $11.35; M. F., 14 x 20, $7.35; do., 20 x 28, scarce; Dean grade, 14 x 20, $5.30 @ $5.37½; do., 20 x 28, $10.50 @ $10.60; D. R. D. grade, 14 x 20, $5.10 @ $5.15; do., 20 x 28, $10.10; Alyn, 14 x 20, $5.32½ @ $5.35; do., 20 x 28, $10.40; Wasters—S. T. P. grade, 14 x 20, $4.87½; do., 20 x 28, $9.00; Abercarne grade, 14 x 20, $4.87½; do., 20 x 28, $8.90.

New York.

Office of *The Iron Age*, 96-102 Reade street, New York, August 2, 1893.

Pig Iron.—The market is dull, and new business is scarce. Deliveries on old contracts continue fair in volume, although postponements are quite frequent. Lower prices are being made for Southern Iron. We quote Northern brands at $14.25 @ $15 for No. 1; $13.50 @ $14.50 for No. 2; $12.25 @ $12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, $13.75 @ $14.50 for No. 1; $12.25 @ $13.25 for No. 2; $12 @ $12.25 for No. 3; $12 @ $12.25 for No. 2 Soft, and $12.50 @ $13 for No. 1 Soft. Gray Forge remains $11.50 @ $12.50.

Spiegeleisen and Ferromanganese.—There is some desire on the part of Steel workers to delay deliveries, but no opportunity to shift shipments to others. Ferromanganese remains nominally $56 @ $56.50 at tidewater.

Billets and Rods.—A moderate-sized lot of foreign Billets for the re-export trade was sold lately. The market is very dull, with quotations nominally as follows: Domestic Billets, $23.00 @ $24, and foreign Billets $28.25 @ $28.50, tide-water; domestic Wire Rods, $30.50 @ $31 and foreign Rods, $39.75 @ $40.

Steel Rails.—There has been no business of any consequence, and the market continues wretchedly dull with little prospect of early improvement. There has been some effort lately to crowd English Rails into the Pacific Coast market. In Street Rails there has been considerable canceling of orders lately because it has been impossible to negotiate bonds.

Track Material.—We quote: Spikes, 1.75¢ @ 1.90¢; Fish Plates, 1.45¢ @ 1.60¢; Track Bolts, Square Nuts, 2.25¢ @ 2.40¢, and Hexagon Nuts, 2.40¢ @ 2.50¢, delivered.

Manufactured Iron and Steel.—In small lots there is quite a good run of orders for Structural Iron, and thus far in this city work has been stopped on only one large building. But new orders of magnitude are scarce. Plates are very dull. We quote: Beams up to 15-inch, 1.80¢ @ 2¢; 20-inch, 2.10¢ @ 2.25¢, for round lots; Angles, 1.75¢ @ 1.90¢; Universal Mill Plates, 1.70¢ @ 1.90¢; Tees, 2¢ @ 2.15¢; Channels, 1.85¢ @ 2¢, on dock. Steel Plates are 1.65¢ @ 1.90¢ for Tank; 1.90¢ @ 2.10¢ for Shell; 2¢ @ 2.15¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock; Refined Bars are 1.60¢ @ 1.9¢, on dock, and Common 1.45¢ @ 1.60¢; Soft Steel Bars are 1.50¢ @ 1.70¢; Scrap Axles are quotable at 1.80¢ @ 2.10¢, delivered; Steel Axles, 1.75¢ @ 2¢, and Links and Pins, 1.80¢ @ 2.10¢; Steel Hoops, 1.75¢ @ 1.90¢, delivered; Cotton Ties, 75¢ @ 85¢ ℔ bundle, at mill.

Old Material.—We quote nominally Old Iron Rails at about $15 @ $15.50; Old Steel Rails, $12.50 @ $13; No. 1 Wrought Scrap Iron at $15 @ $15.50, and Car Wheels at $11.50 @ $12.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, August 2, 1893.

The Pig-Tin market is flat. Trading has been light and consumers have purchased in a very indifferent way. Early in the week there were some signs of activity, due to better inquiry from the Continent and full prices realized at the Banca sale, but subsequent realizations and hesitancy of speculators to venture, owing to the uncertain future of silver, caused a reaction. The latest transactions were at £81. 10/ for spot and £81. for three months' futures. The visible supply is estimated at 14,817 tons.

Copper has been barely steady. Free selling on American account and continued financial dullness, together with the Coal strike, accentuate an already depressed market. There have also been realizations that helped the market downward. The selling was chiefly of forwards. Transactions in furnace material include 2000 tons Argentiferous Matte at 9 shillings, silver free. Full American supplies have not increased the visible stock to any great extent, which would indicate that the absorbing power of Europe continues good in the face of unfavorable general trade conditions. The consumption in France is particularly active. Last prices on Merchant Bars were £41. 17/6 for prompt delivery and £42. 5/ for three months' futures. Best selected English is quoted at £47. During past month spot stocks decreased 122 tons and visible supply increased 528 tons.

In Tin Plate there has been hardly anything doing. The 'Frisco and Russian demand that was prominent last week appears to have been satisfied. Ternes and Black Plate are unusually quiet and buyers appear apathetic. Makers claim that present prices leave no margin of profit. Liverpool prices are as follows:

IC Charcoal, Alloway grade	13/0 @ 13/6
IC Bessemer Steel, Coke finish	12/0 @ .. .
IC Siemens " " "	12/3 @ ....
IC Coke, B. V. grade, 14 x 20	11/9 @ 12/
Charcoal Terne, Dean grade	11/9 @ 12/

Pig Lead has met with moderate sale, but prices have ruled firmer, closing at £10. 2/6 @ £10. 5/ for Soft Spanish.

Spelter finds slow sale and prices are easy at about £17. 10/ for ordinary Silesian.

In the Iron and Steel trades business has been quiet and prices have undergone little change. Last sales of warrants were at 42/2 for Scotch, 35/6 for Cleveland, and 45/3 for Hematite. Makers' price for Bessemer Pig has been advanced to 46/6 f.o.b.

Work in the Shenango Valley.

While operations are almost at a standstill in the New Castle, Pa., district, a great deal of preparation is being made for the future. The only concerns in operation are the Arethusa Iron Works of Geo. W. Johnson and the blast furnace of the Crawford Iron and Steel Company. Other industries are all making more or less improvements. The Shenango Valley Steel Company have added two large hydraulic cranes in their blooming mill, together with other improvements, among which is three new boilers, tubular design, 84 inches diameter. The New Castle Tin Plate Company are turning over the machinery in the black plate mills and getting it down to an easy bearing before making any attempt to roll plates. The tinning department is not yet completed but is rapidly approaching that state. This plant is said to be the best equipped in this or any other country. Jacob James has resigned his position as Superintendent of the Arethusa Iron Works and Isaac Hill, who had charge of the plate mill, has taken similar action. Both gentlemen have been connected with this concern for many years.

The repairs of the Rosena Furnace, now owned by the Rosena Furnace Company, are being pushed to completion rapidly as possible. Four new fire-brick stoves are being added, also a new blast engine, gas flues, 12 new boilers and new casting house. The trestle work and stock-house is being repaired and everything is being placed in first-class order, so as to insure a regular daily output of at least 200 tons. The New Castle Wire Nail Company have added 4 new boilers, 50 nail machines, 3 large new wire blocks in the wire drawing department and a large addition in the line of buildings.

The J. P. Witherow Company are running part of their force, probably 75 men.

The Vulcan Iron Company are running their foundry and machine shop to full capacity, mostly upon repair work, no new business being in sight.

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The recent failure of the Douglas Furnace Company of Sharpsville, Pa., caused a sheriff's sale of a large quatity of pig iron. It is understood that nearly all was purchased by creditors of the company. Prices realized were probably the lowest on record. White iron was sold for $5. Nos. 1 and 2 fetched $6.75 to $8 per ton.

The American Tube & Iron Company.

The American Tube & Iron Company, the second largest tube and pipe manufacturers in the United States, with plants at Middletown, Pa., and Youngstown, Ohio, have made application for the appointment of receivers. The principal creditors are the Harrisburg Rolling Mill Company, Harrisburg, Pa., the amount due that concern being $175,000. Col. James Young, president of the American Tube & Iron Company, and a stockholder and creditor, is also named in the bill of complaint, presented in the language of the bill in behalf of themselves and such other creditors as may become parties thereto. For the purpose of hearing the bill of the company and the answer of the company a special term of court was held at Harrisburg, Pa., on July 27, and the court appointed as receivers, A. S. Matheson, general manager of the company, A. M. Momoyer secretary and treasurer, and Robert Neal, president of the Harrisburg Rolling Mill Company.

The bill states the company were organized April 29, 1874, with a capital stock of $1,000,000, divided into 20,000 shares at $50 per share, to engage in the business of manufacturing iron and iron tubes. The property of the corporation consists of their establishments and plants at Middletown and Youngstown, and they have stores and warehouses at 98 John street, New York; 54–60 Canal street, Chicago; 900–905 North Second street, St. Louis; Smithfield and Water streets, Pittsburgh; 99–101 Water street, Cleveland, and 19 Pearl street, Boston. The cost of their plant and machinery now on hand is more than $1,200,000. The company have on hand manufactured and in process of manufacture product worth $800,000.

The bill further states that there are outstanding credits of $700,000 and the company have a large number of contracts on hand. The company are indebted upon bills payable and for wages and salaries in the aggregate of $1,250,000. The assets are placed at $1,900,000. The company have been doing an average business of $5,000,000 a year, and though possessed of property sufficient to pay all indebtedness they are insolvent in the sense that they are without funds in the shape of cash or assets convertible into immediate cash sufficient to pay their indebtedness, which will mature in a short time.

The plant at Middletown was established 13 years ago and began with about 75 men. At present the daily product is about 250 tons. The company's Western mills were erected in 1886 at Youngstown. The daily output of these is about 150 tons.

Col. James Young, who has been president of the company since their organization, gave out the following statement: "The company started with a production of 1500 tons per annum and have steadily increased until their production now when running full capacity is about 120,000 tons per annum. The company's assets would wipe out all liabilities and leave the plants clear to the stockholders. There are no judgments, mortgages or preferences. The present condition of the company has been brought about by the existing strained financial situation of the country. It is impossible to get in a fair proportion of collections, and what collections are obtained consist largely of notes or commercial paper, which it is impossible to have discounted or used to a sufficient extent. This condition of affairs is not confined exclusively to the American Tube & Iron Company, but is general throughout the country. The American Tube & Iron Company have enjoyed the highest line of credit, which has never been abused or taken advantage of. Under ordinary conditions of trade and finance the company's ability to continue meeting their obligations would be unquestionable."

The plants at Youngstown, Ohio, and Middletown, Pa., have both been closed down. The receivers will have an inventory of stock taken and it is probable that when this is done arrangements will be made by which both plants can resume operations. The wages due employees at Youngstown and Middletown were paid on Saturday, July 29.

A somewhat spirited meeting of the puddlers and other members of the Amalgamated Association in the Mahoning Valley was held at Youngstown, Ohio, on Saturday, July 29. The object was to hear an explanation from the officials of the organization as to why cuts in wages had been made. President M. M. Garland and Secretary John C. Kilgallon were present and addressed the dissatisfied iron workers. The meeting was secret, but at its close it was stated that a motion was made indorsing the action of the conference, which was declared carried by Mr. Garland, who acted as chairman. His decision was questioned and a call for a division was made but not granted. The question was made as to the legality of the meeting, but President Garland decided that it was legal. Many of those present declared that they would secede from the Amalgamated Association rather than accept the reduced rates.

The sheriff of Cook County took possession on July 29 of the manufacturing plant of the Goulds & Caldwell Company, manufacturers of pumps, pipes, hose and belting, and general mill contractors, at 22 and 24 North Canal street, Chicago. The sheriff's act was in pursuance of a confession of judgment in the Circuit Court in favor of the National Bank of America for $20,000.

Anderson, Dupuy & Co. of Pittsburgh have announced a reduction of 10 per cent. in wages.

A receiver has been appointed for the Eagle Machine Works, the largest general machine shops in Indianapolis, Ind. The company have been doing business for 45 years. Their liabilities are about $100,000 and their assets nominally $150,000. The failure was precipitated by the closing of the Indianapolis National Bank.

The International Steel Post Company, St. Louis, recently issued invitations to a number of prominent business men to witness a test of the machinery used in constructing their fence posts, at the company's works in St. Louis. Quite a number took advantage of the opportunity presented, and the trial proved a success. Posts were made at the rate of 350 per hour. The posts are made of sheet steel in lengths from 2 feet up to 8 feet. They are put on the market at remarkably low figures, and the company claim that they cost no more than cedar posts. Your correspondent saw one of the posts withdrawn from the ground, and it is only necessary to say that it took the combined power of three men 15 minutes to take the post out, and when it was withdrawn it was twisted entirely out of shape.

The boiler manufacturers of New Orleans, La., on whom a demand was made for a nine-hour day with ten hours' pay, after presenting a solid front for several days have unanimously acceded to the demands of their boilermakers. This action was precipitated by the granting of the demand by one of the leading boiler shops of the city.

The automatic micrometer rolling mill gauge has been very favorably received by the trade. Among the concerns already using them are the Paxton Rolling Mills, Harrisburg; the Larbon Steel Company, Pittsburgh; the Lukens Iron & Steel Company, Coatesville; Spang Steel & Iron Company, Pittsburgh, and the Parkesburg Iron Company, Parkesburg. Other concerns are contemplating an early adoption of the gauge.

Lloyd's shipping return for the quarter ending June 30 gives the total tonnage of vessels under construction in British ports on that date as 609,120 tons, of which 515,791 tons were steamships and the remainder sailing vessels. The numbers, respectively, were 260 steam and 92 sailing ships. This is about 170,000 tons and 95 bottoms less than the figures for the corresponding date of 1892.

N. & G. Taylor Company continue to make a good showing at their tinplate works in Philadelphia. The following figures, furnished by the firm exhibit their output of tin and terne plates for the six months ending June 30:

	Net weight. Pounds.
Tin plates lighter than 50 pounds per 100 square feet	1,190,738
Tin plates weighing 50 pounds per 100 squre feet	691,226
Tin plates weighing 62½ pounds per 100 square feet	105,117
Tin plates weighing 63 pounds per 100 square feet and heaver	503,301
Terne plates lighter than 50 pounds per 100 square feet	1,753,383
Terne plates weighing 50 pounds per 100 square feet	1,656,946½
Terne plates weighing 62½ pounds per 100 square feet	54,641
Terne plates weighing 63 pounds per 100 square feet and heavier	333,902½
Total	6,289,255

Chester Furnace of the Wellman Iron & Steel Company, Thurlow, Pa., is to blow out soon.

The Lorain Brass Works at Elyria, Ohio, have filed a deed of assignment.

Worthington pumping engines will be used for the water supply of the City of Osaka, Japan.

The Rome Brass Works have shut down.

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HARDWARE.

Condition of Trade.

THE VOLUME OF BUSINESS in all parts of the country continues to be very small, orders being strictly confined to the requirements of dealers. Manufacturers and jobbers are making very little effort to sell goods and are confining their energies to making collections and keeping down expenses. In many instances orders previously given are being reduced or countermanded, and in some cases deliveries deferred. Collections continue difficult, although some houses report an improvement in this respect. Stocks of manufactured goods are not in general large, manufacturers having during the whole of this year pursued a very conservative policy in this respect, and are now reducing their production to prevent any great accumulation of goods. This policy will save the market the danger of being depressed by large stocks of goods which manufacturers might find themselves forced to sacrifice. The improvement in the financial situation during the week has had an encouraging effect upon the business community, and the opinion is very general that the reaction has begun. Among the important factors in this are the exports of produce and securities and the consequent importations of gold. Our exports of hay on account of the scarcity of fodder in Europe promise to be very large, and the prospect of this has led to a great demand for Bale Ties, on which a scarcity is apprehended. The low prices which have prevailed for a long time in manufactured Products seem to remove the danger of any sensational decline in the market.

Chicago.

(By Telegraph.)

Shelf Hardware jobbers report continued dullness which is felt in every line, the demand for Builders' Hardware being far below the average at this time of the year, while staple goods are moving in very light quantities only. Jobbers are receiving reports from manufacturers that they are closing up their establishments to wait for a revival of trade. Purchases being made here for stock are now only about one-quarter of their usual volume. If this rate holds good throughout the country the stock of goods held in the wholesale Hardware trade will soon be down to such a low point that a revival in the demand cannot fail to cause such a rush for orders from all sections as to overwhelm manufacturers with business. The congested condition of the Hardware trade thus appears likely to result at some time in the future in activity fully as pronounced in its way as the present dullness. This is a contingency to be guarded against by those who are able to keep their stock of goods in fair condition. Much is heard now of the generally excellent condition of the farmers, who have had two good years, enabling them to pay off mortgages, while all crops are fair this year with a heavy demand from abroad. Collections are growing better, if anything, showing that people are liquidating their indebtedness as fast as possible, thus putting themselves in good financial shape.

St. Louis.

(By Telegraph.)

There is no improvement to note in the demand for Hardware. Jobbers are not pushing trade, but are carefully scrutinizing all orders received, and making collections wherever it is possible to do so. Requests from customers for extensions are becoming an every-day occurrence, and several are received in each mail. Manufacturers, of course, feel the effects of these hard times, as jobbers refuse to place their usual orders for fall delivery, preferring to take the risk of not getting the goods when wanted rather than order at this time. Collections are difficult to make, but are a trifle easier than last reported.

Cleveland.

THE W. BINGHAM COMPANY.—July, always a dull month, was, perhaps, a little more so than usual this year. Travelers are mostly off the road, and mail orders are only for immediate and pressing needs. Uncertainty as to the future continues. Trade is not being pushed in any direction. The crop outlook is excellent, and we are in hope that when the vacation season is over and every one has been to the Fair business will resume its wonted course, and that these times of depression will have awakened every one to the fact that goods cannot continually be sold at cost, or below, without eventually bringing the seller to a reckoning. The one redeeming feature, so far as Hardware dealers are concerned, of this so-called "panic," as compared with others we have passed through, is that it finds us with prices at the bottom, and that upon top of everything else we shall not have to stand a reduction on our stocks (as we did once) of nearly 40 per cent.

City dealers report trade as dull. Many mills are either closed down entirely or running on half time, and building operations have to a large extent suspended for a time, owing to the lack of money to carry them on. The suggestion in your issue of July 20 that the Hardware associations throughout the country take action requesting Congress to repeal the silver purchasing clause of the Sherman bill is a good one, and has been acted upon by our association here. In addition to this, let us all stop talking hard times. If we cannot say anything encouraging, don't say anything at all.

Baltimore.

CARLIN & FULTON.—The month of July just ended will pass into history as one of the dullest ever experienced in trade, and filled with the records of financial depression and disasters, and yet in strong contrast with the wreck of numerous banks and the unparalleled depreciation of stocks are the comparatively few and uneventful failures of mercantile houses and the almost unchanged quotations for manufactured Hardware.

There has undoubtedly been a check to the commercial and industrial interests of this country which will require a long time to overcome, but which will be followed by a decided reaction, beginning, as we believe, with the repeal of the Sherman bill when Congress meets.

The daily papers have heralded throughout the country far and wide every instance of a suspended or collapsed bank, and it is no wonder that the depositors in savings banks have in many cases become timid and alarmed and have precipitated runs upon institutions whose securities are undoubtedly of the best character, but which do not consist of money lying idle in their vaults awaiting demands which in ordinary times would never occur.

In this city we have not had a failure of an incorporated bank for over half a century, and, as far as known, in the State of Maryland not a single bank has had the slightest difficulty, and in every case the usual dividends have been paid.

The hoarding of money and the consequent scarcity of funds to loan, followed by an increased rate of interest, prevents the marketing of bonds issued at a low rate of interest and in that way stops the operations of great corporations who would otherwise employ the very people who are withdrawing from the banks and locking up their

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savings which ought to go into circulation.

From one section of the South the salesman writes that the retail merchants at public meetings have resolved to make no new obligations until after the condition of the cotton crop shall have been positively known and then, should the price of that staple be satisfactory, they will go North to make their purchases.

From another section we are told that many of the merchants will visit Chicago, returning to their homes in the South via New York and the seaboard and make their purchases in the Eastern cities then. One of our customers writes us as follows:

In this place we have little in the financial way to worry us. We read of the smashing of banks and the failures of huge corporations as the man who lives far from the seaboard reads of storms and shipwrecks. Our financial condition appears locally to be without excitement. The marketing of the potato crop has brought considerable money into our county and helped the farmer, which means help for us all. Our crops at present promise a good yield and I hear of no trouble among our merchants. So far as I know we are all paying our bills at maturity and hope for a better trade this fall. If no disaster overtakes the crops, I think this is a reasonable hope. We take the 57-cent silver piece for a dollar and pass it out for the same. The cold weather last winter killed all our fig trees, but the vine is left to us to sit under and it hangs heavy with grapes and we hope that wisdom will be given to Congress to legislate for the best.

We Episcopalians will pray for them at morning and evening service, and if any of us are righteous we have promise that our prayers will avail much.

Our reason for introducing this letter from our correspondent is that it undoubtedly represents the condition of the bulk of the trade throughout the country and there is no reason in the world, after common sense returns to those who control the financial policy of this country, that we should not only have an active trade, but a large business in which credits will be based, not upon inflated values and for speculative purposes, but upon actual worth, and to supply a demand which has been kept at the lowest possible point for the last two years.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—There is nothing special in the way of trade to report, except that it is still light. Jobbers are making very little effort to sell goods, preferring to wait and see what the financial as well as the crop outcome is going to be. Banks in the "silver States," as also in some other localities, are going through a sweating process which, it is hoped, is mainly over. Minnesota and both the Dakotas have had remarkably few bank suspensions. Not a national bank in Minnesota has closed and very few in the Dakotas.

St. Paul has not had the faintest ripple of disturbance during the whole period of liquidation, either as to any of its banks or business houses.

But these are unsatisfactory times for business and every one is anxious to see the prospect of better days certainly approaching.

As to crops, there has been some improvement in the last fortnight, but crops will not be above fair on the whole, though they are fairly well distributed and there will be no sections left in bad shape by crop failure.

Fall trade will not begin early.

Collections have been fully up to expectations, which has been the great relief of our business houses in these times, when they are compelled to rely mainly on their own resources.

Portland, Ore.

CORBETT, FAILING & ROBERTSON.—There is little or no change in the situation throughout this Northwest country. Two more banks have suspended at Tacoma—making three in all—the oldest and what have been considered the strongest. There have been too many banks in the newer cities, Tacoma and Seattle each having more banking capital than Portland, while the Clearing House here has always shown a business in excess of both places combined.

Our local banks still continue to grant needed accommodation for all legitimate business requirements, and that, too, without raising interest rates.

Harvest is now under way and prospects are flattering for quantity, if not for prices. Wheat has touched a lower price than ever known here.

Wool, of the grade known as Eastern Oregon, has sold as low as 5 cents per pound.

Orders still continue to come in, of the hand-to-mouth style, showing that the trade is very conservative.

Our business on this coast having been conducted exclusively on a gold basis, we naturally hope for a prompt repeal of the Sherman act when Congress meets, and that, too, without any substitute.

Omaha.

LEE-CLARKE-ANDREESEN HARDWARE COMPANY.—It is natural that Omaha should feel the effects of the general depression in business, in common with other large trade centers. This was to be expected. The larger the city and the more extensive its commerce, the more liable it is to feel the full force of every disturbance in the business world. The general tendency, therefore, this month has been toward a reduction in the volume of business, still the total volume has been larger than one would naturally expect under the circumstances.

Outside of the present financial stringency it is a recognized fact by all that there is no real cause for hard times in Nebraska. The splendid crops of the past two years, together with high prices realized for farm products, have put our farmers in splendid condition financially.

At the present time the prospects for the coming crop may be stated as very satisfactory. Retail merchants are buying only what they absolutely need and waiting to see "how things are coming out." Jobbers are generally doing the same thing. A general reduction of stocks and delay of purchases comprise the principal feature of the market. When confidence revives there must necessarily be heavier buying all along the line, since, from all accounts, stocks are insufficient at present to meet the requirements of a brief period of active business. It would not at all be surprising that at some not far distant day Nebraska merchants will crawl out of their cyclone cellars and discover that the financial storm had past, and then will commence the race to stock up again.

Even under the best of conditions collections are expected to drag at this season of the year, and farmers are usually compelled to ask for time on their store accounts until their products can be marketed. There have, however, been times when collections were much worse than they are now.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—There is no great change in trade circles since our last letter.

It is quite evident customers are trying to keep up their courage until after the meeting of Congress, and are ordering only for immediate wants or in anticipation of their wants for the near future.

The fact is a large scare pervades the entire country, and the failure of numerous banks throughout the country has naturally caught some customers with balances remaining in bank to be used as mercantile bills would become due. In other instances customers of theirs have suffered from the closing of banks, hence interfering with their own collections.

This state of affairs has naturally interfered with the failure of collections now due and over due. There is unquestionably a heavy responsibility on the hands of Congress at the extra session. It remains to be seen if they are equal to the emergency and will act prudently and at once. There can be no question as to the desire of the entire country at this moment. The action taken by the New York Chamber of Commerce, which has been followed by other large organizations in New York and Philadelphia, and more recently in other large cities throughout the entire country, together with organizations embracing members of each political faith, plainly shows the immediate necessity of the repeal of the silver purchasing clause, about which so much has been said and written.

The present monetary condition of the country has certainly been reached at a terrible sacrifice, which should be realized by all members of Congress, and although thus far the failures have been largely confined to the banking interests and declines in stocks, and have not as yet reached the mercantile and manufacturing industries to the extent that they did in the year 1857, we are only indebted for this to the sys-

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tem of the national banks instead of the State bank system which was in vogue during 1857, this alone preventing a widespread disaster. We feel that any who were in doubt as to the advisability of a continuance of the national bank system over the State bank system of 1857 have certainly changed their views. Had we been flooded with State bank currency which existed in 1857, the panic of that year would appear small in comparison with what we would now have upon us.

We have occasionally letters from the readers of *The Iron Age* relating to our semi-monthly letters, and we prefer answering these through the columns of *The Iron Age* rather than by direct correspondence. One question asked is: Do we consider the Sherman silver purchasing clause the sole cause of the present financial embarrassed situation? Our feeling is positively and emphatically, No. It is but one of the causes in the "catalogue list."

There is no doubt of the advisability and importance of the immediate and unconditional repeal of the silver purchasing clause of the so-called Sherman law.

President Cleveland might well say, "Deliver me from my friends; my enemies I can take care of." When he was elected by a large majority, with a majority of both Houses of Congress largely of his political faith, the country felt satisfied that his intentions were good and that he would have a majority of both Houses in Congress to sustain and support him, but did not realize that he had enemies of his own political faith in the camp, and it soon became evident that if he were to call an immediate extra session of Congress his friends would defeat any financial measure which he may have had in view; hence we suffer from the fact of drifting along without the policy of the Government being made known, and, as we stated in *The Iron Age*, under date of July 6, a country cannot remain passive successfully while waiting for something to turn up, especially where immediate action is required.

The policy of inaction causes uneasiness. The path of uneasiness was opened before March 1, when partisans (supposed friends) gave the country editorials, in which they stated that when our surplus had reached the $100,000,000 mark we were bankrupt, and boldly stated that we humiliated ourselves by asking large financial centers for gold, which in April went below the hundred millions, and, if correctly reported, the Secretary of the Treasury refused assistance from the New York banks because the friends of the administration had opposed that policy.

It was well known by those institutions who watched the large importations coming into this country, and also had an eye on the small exports going out, that we could not maintain our gold reserve at the $100,000,000 mark. Importations were coming at an unprecedented rate, and during the last year over $100,000,000 was paid for these importations over and above the amount one year ago.

The country then became more uneasy, and, if corretly reported, the Secretary of the Treasury stated that he did not consider it necessary to redeem the silver certificates in gold. The result was that all financial institutions considered a conservative policy necessary. Western and Southern banks could not secure the funds they required, and the consequence was failure after failure of banks throughout the country.

The situation was appalling. President Cleveland then was interviewed, and, if correctly reported, stated that we would redeem both our gold and silver certificates in coin. Our financial credit should be sustained, but here was a vacillation that the country did not understand. No one supposed these were individual opinions without consultations with each other, or without consultation with the cabinet officers, and with these two opinions before the country we continued to buy silver and pay out our gold, which all sound financiers understood full well should be increased if we were to protect our credit as stated by Mr. Cleveland, and not in accordance with the policy stated by the Secretary of the Treasury.

If our readers will look back and refresh their memories a few short years they will remember the United States Treasury was in a condition which a great nation like ours should always hold, with a surplus in their vaults, but the theorists reasoning hypothetically imagined they had discovered a great disadvantage rather than an advantage in this surplus.

The politician saw in this surplus something to attack which might perhaps work to his party's advantage. Therefore, in secret council he decided that "reduce the surplus" should be the campaign cry. The reasons given for the reduction, although absurd in practice, appeared to take with the masses, while the heads of successful financial institutions and bank officials all expressed fear of the ultimate result, yet it became the popular cry, and at the same time about as difficult to comprehend as it would be to comprehend how a bank would be financially stronger with $100,000 surplus than it would be with a $500,000 surplus; or how a large manufacturing or mercantile house could be financially stronger, and sustain better credit, with a small stated capital without any surplus than there would be with a surplus beyond the legitimate capital.

They were also unable to comprehend how any one could arrive at the opinion that $100,000,000 surplus, instead of $250,000,000, was just the required amount to place our country financially strong above all contingencies. These wise men evidently did not realize when foreign countries wanted money, or when foreign manufacturers were determined to have money, and had merchandise to sell, they would realize upon it regardless of price or our tariff upon the same article.

Nevertheless, "reduce the surplus" became a perfect howl throughout the country, quite equal to the present cry of "repeal the Sherman silver purchasing clause." This cry was adopted by the political party who suggested it.

We stated in an article in *The Iron Age*, in February, 1892, that the present McKinley bill was the result of the political agitation to reduce the surplus. About this there can be no doubt, and while the effect of the McKinley bill was to increase the tariff on some few articles, a larger number were admitted free of duty, the net result of which was to reduce the income of the Government, and as each Congress exceeds the expenses of the previous one, the income was not sufficient to carry on a great nation like our own. Therefore there was no opportunity to further increase our surplus, unless by the sales of new bonds.

Here was our mistake, for had we retained our $250,000,000 surplus there would have been no cry of this silver purchasing clause in 1893, but with our increase of silver certificates and the $100,000,000 increase in importation, with the diminished export trade, the result is before the country, which may now be partially corrected (and no doubt will be), first, by the repeal of the silver purchasing clause, and next through reduced importations, as the country is in no condition at the present time to place large orders for imported goods. These two, we trust, will keep our gold intact.

This is a subject that cannot be treated upon in one short article, and more will be said hereafter.

Boston.

BIGELOW & DOWSE.—Thus far there has been no unusual falling off in trade or in remittances the past month. A prominent retail dealer in this city reports his trade for the last five months in excess of any previous year and that his remittances the past month are in excess of those of the previous month. He thinks if less was said about hard times it would be better for every one.

Hardware must necessarily be effected by the very general shutting down of the mills throughout New England, if they remain closed for any length of time, but up to the present time the trade here has felt but little the depression reported from other parts of the country.

There has been an unusual demand for both Wire and Cut Nails. Smaller dealers, who usually buy in carload lots, are now supplying their wants from the jobbers in preference to increasing their stock in the present uncertain times. This same feeling among the retailers leads them to send fewer orders for general Hardware to the factories and to depend more on the jobbers' stocks. In this way they supply their wants without materially increasing their stock.

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The future seems to depend wholly upon the action of Congress and the prompt repeal of the silver clause.

Louisville.

W. B. BELKNAP & Co.—We are pleased to report a fair movement of goods despite extreme financial stringency and several bank suspensions in our own city.

Business is not what we should like to see, nor up to expectation for this season of the year, when buying is generally active and on a large scale, but the regularity of small orders and their aggregate proportions convince us that the goods are for actual consumption, and indicate extreme lightness of stocks throughout the whole country.

No concessions in price have been made since our last writing. If anything, prices are somewhat firmer for the staple goods, owing, we take it, to a prospective short supply. Certainly if the mills do not start, and there is any demand at all, the stocks must show it, and those who have the goods to furnish on notice are entitled to a fair price.

Bank suspensions here amounted to five in all, but it is not unlikely that two or three of them will resume business shortly. The Government officers placed temporarily in charge declare that their condition is good, and they only yielded to a very acute attack of insufficient supply of ready cash. The crisis seems to have passed and everything at present writing is on the mend.

With these banks out we believe there are still some 15 or 16 in the Clearing House, which would seem to be ample for the requirements of a community the size of ours. Large amounts in the aggregate have been drawn by depositors and even the country people, they say, can pay the cash as they go from their own persons. Be that as it may the coming Congress is watched with intense anxiety. The press and the people here favor the repeal of the Sherman bill as a start toward a stable basis of values.

Notes on Prices.

Cut Nails.—The majority of mills producing Cut Nails are either closed or running very light. The movement of goods is very small and prices still rule at $1.05 for carload lots at mill, but this price can be shaded for desirable specifications in both Iron and Steel Nails. Small lots from store in New York are quoted at $1.30.

Chicago, by Telegraph.—The demand for Cut-Steel Nails is still confined to small lots only, and the idle factories are offered no encouragement whatever for resuming operations. Prices remain unchanged at $1.20 to $1.25, Chicago, for carload lots from factory, and $1.25 to $1.30 for small lots from stock.

Wire Nails.—The makers of Wire Nails are still endeavoring to make some arrangement among themselves which will restore the business to a profitable basis, and they express a good deal of confidence in the ultimate success of these efforts. In the meantime they have agreed to keep all the mills closed during the month of August. Stocks in makers' hands are light, and in most instances assortments are badly broken. For carload lots at mill $1.35 is the regular price, but sales have recently been made at figures shading $1.30.

Chicago, by Telegraph.—Manufacturers are now having weekly meetings for discussion of ways and means to improve the condition of trade. They were not able last week to arrange matters finally for the perfection of a plan to restrict production, which is under contemplation, but the subject is to be considered at further meetings. It is likely that the factories will be kept closed during the month of August, as stocks have not yet been reduced to a point which makes it necessary to resume operations. Prices are unchanged at $1.45 Chicago, for factory lots and $1.55 to $1.60 for small lots from stock.

Barb Wire.—There is very little doing in this article, but prices remain firm at $2.45 to $2.50 for carload lots of Four-Point Galvanized at mill, and small lots from store at the usual advance.

Chicago, by Telegraph.—Stagnation prevails in this branch of trade. The only movement reported from any part of the country is from the extreme South, where planters and farmers have harvested their crops and are now beginning to purchase Wire to improve their farms. This movement, however, is not of sufficient importance to extend to the factories in this vicinity, which are still closed. Prices can be quoted as before at $2.10 for carload lots of Painted and $2.50 for Galvanized. Jobbers maintain quotations on small lots from stock at $2.30 and $2.70 respectively.

Excelsior Measuring Tapes.—Keuffel & Esser Company, 127 Fulton street, New York, are offering their line of Excelsior Tapes at a discount of 20 per cent. from the following list, which includes the leading numbers:

Steel, ⅜-inch wide, leather case, flush handle (English style), each:

25	33	50	66	75	100 feet.
$3.75	4.35	6.05	7.70	8.60	10.60

Steel, ⅜-inch wide, leather case, patent center, each:

25	33	50	66	75	100 feet.
$3.95	4.55	6.25	7.90	8.80	10.80

All Linen, ⅝-inch wide, leather case, flush handle, each:

25	33	50	66	75	100 feet.
$1.85	2.10	2.55	2.90	3.20	3.95

All Linen, ⅝-inch wide, leather case, raised handle, each:

25	33	50	66	75	100 feet.
$1.50	1.75	2.20	2.45	2.70	3.40

Metallic, ⅝-inch wide, leather case, flush handle, each:

25	33	50	66	75	100 feet.
$1.65	1.95	2.35	2.70	3.00	3.75

Metallic, ⅝-inch wide, leather case, raised handle (English style), each:

25	33	50	66	75	100 feet.
$1.50	1.75	2.20	2.45	2.70	3.40

Paine's Tapes, Steel, 5-16-inch wide, japanned case, each:

25	33	50	66	75	100 feet.
$2.75	3.60	4.75	6.35	7.90	9.50

Their steel Pocket Tapes are subject to a discount of 33⅓ per cent. from the accompanying list:

Steel Pocket Tapes, German silver cases, per dozen:

3	5	6	9	12 feet.
$13.20	16.80	19.20	28.20	39.00

Traveler's Drinking Cup.—T. H. Clifford, 265 Dearborn street, Chicago, is putting this article on the market, a description of which appeared in *The Iron Age* several weeks ago. The Cup is sold to the trade at $3 per dozen.

Glass.—The condition of the Glass trade is much the same as that of other lines. There is some business being done, in amount of course small compared with that of previous years, and collections are slow. Reports from Western cities indicate a partial cessation of building operations, which condition, to a greater or less extent, is found throughout the entire country. On the other hand, stocks of Glass are not large and prices are as well maintained as they have been for the past six months. When the country recovers from its present financial condition, the Glass trade will, from present indications, be in an excellent condition to reap the benefits of renewed activity. The coming together of the Wage Committees of manufacturers and workmen will probably take place during the present month, and there is no indication at the present time of there being any hitch in arranging the scale for the coming fire. Provision will probably be made for a proportionate reduction in wages, should the tariff on imported Glass be reduced. The date upon which the factories will resume work is undecided, although September 1 is the usual time for beginning. Prices at which Glass is being sold in Philadelphia, Baltimore and Southern markets are reported as still being somewhat below the rates established by the National Window Glass Company, and it is understood that imported Glass quotations are shaded in some cases. No new developments have taken place in the Plate Glass market, although it is stated one concern is again running; producing, however, a very limited amount of Glass. Quotations on Glass remain unchanged, as follows: American Window Glass 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

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Hardware Organizations and the Financial Situation.

THE Cleveland Hardware Jobbers' Association at a special meeting held on the 28th ult. passed the following resolutions:

Whereas, Our country during the past few months has been greatly disturbed financially and our business interests seriously affected; be it

Resolved, That it is the sense of the Cleveland Hardware Jobbers' Association to allay the distrustful feeling existing as much as possible. We are of the opinion that one of the chief causes of the present condition is the purchase clause embodied in the Sherman law, passed July 14, 1890, enforcing the purchase of silver. The practical operation of said law is working to the detriment of the best interests of all trades and causing distrust among foreign nations regarding our financial policy.

Resolved, That Congress at its special session be earnestly requested to repeal that portion of the said Sherman law as far as it relates to the enforcement of the Government to purchase silver.

Resolved, That we respectfully urge upon Congress not to consider any question that shall prolong its special session and stir up strife and uncertainty throughout the country, believing that such would neutralize the effect of the repeal of the purchasing act of the Sherman law and leave the business interests of the country without such encouragement as would restore the necessary confidence.

At a special meeting of the Hardware Merchants and Manufacturers' Association of Philadelphia, held on the 28th ult., the following resolution was unanimously adopted:

Whereas, The financial and business interests are now very seriously unsettled and credit is much curtailed, showing a loss of confidence, and thereby trade is greatly retarded; and

Whereas, It is believed this condition of affairs is largely owing to the so-called Sherman bill, by which the United States has been a compulsory buyer of silver to the extent of 4,500,000 ounces per month, and this enforced buying, undertaken at the request of the silver men, has proved inadequate to maintain the price of silver, which has been steadily decreasing; therefore, be it

Resolved: That our association heartily request the repeal of the purchasing clause of the so-called Sherman bill; that we petition Congress to give the matter such careful, wise and far-sighted consideration as will insure for our country a stable and unvarying standard of money, free from all danger of fluctuation or depreciation, and which will be equally good in exchanges with other nations.

The secretary of the Southern Hardware Jobbers' Association, comprising 56 of the largest jobbing firms in the South, has addressed the following letter to all the members of that association:

GENTLEMEN: You have doubtless noticed the leading editorial on page 123 of *The Iron Age* of July 20, entitled "Hardware Organizations and the Financial Situation."

It seems to be universally conceded that the chief cause of the present financial disturbance is that clause of the Sherman act making it obligatory upon the Government to purchase 4,500,000 ounces of silver per month. Whether it is best for the future of this country to return to a gold basis or to keep up a parity between gold and silver, to restrict silver coinage or to pass a law authorizing the free and unlimited coinage of silver, the writer and each individual member of our association has his own convictions; but certainly with the present condition of the country, with banks suspending by the score daily, with manufactories and furnaces closing down, with the vast armies of laboring men out of employment, with manufacturing and commercial firms with unquestioned resources daily being driven to the wall for the need of comparatively small accommodations which the banks are unable to extend, with farm products at an almost unheard-of low price and with business comparatively at a stand-still, it is certainly an opportune time for us all to use what influence we have to improve the situation.

The Iron Age is correct in stating that the Congressmen and Senators are influenced almost solely by the interests of their constituents, they simply being the servants of the people they represent.

The writer has prepared a petition (a copy of which is inclosed) for the signature of the Tennessee members of our association, three copies of which will be signed, one for each of the Senators and one for the most influential member of the House.

If this meets your views, please sign the inclosed copy and forward same to the member of our executive committee for your State without delay.

Urge the prompt repeal of the purchasing clause of the Sherman act, which will restore confidence to the country, and let the future of silver be settled by Congress after a calm and mature deliberation. Yours truly,

W. P. SMITH.

The following is the petition referred to in the foregoing letter:

We, the Tennessee members of the Southern Hardware Jobbers' Association, recognizing that the United States is now passing through one of the most intense financial strains of its history, and believing as we do that the purchasing clause of the Sherman Silver act is one of the most important causes of the crises through which we are now passing, and believing also that were this clause repealed confidence would be at once restored, both at home and abroad, hoarded currency would at once return to our banks, foreign capital would again seek investment in America, and the industrial progress of this country would be resumed.

We feel that nothing but the speedy action of Congress will effectually remove the fear which is now paralyzing all branches of the business world.

We, therefore, earnestly petition you, as one of our representatives in the National Legislature, to use your influence for the speedy repeal of the purchasing clause of said act as soon after the assembling of Congress as possible.

We are perfectly willing to trust the future of silver to the deliberations of the present Congress, but, recognizing that such deliberations will require time and study, we feel that the country should not be forced to continue in the present demoralized condition until such times as the majority in their judgment may unite upon the most feasible plan for its future.

We feel that the first duty of Congress is to remove the cause which is daily forcing the suspension of our financial institutions, closing our factories and furnaces, depriving labor of its legitimate employment, and reducing all branches of business below the minimum.

Any assistance offered by you for the country's relief will be greatly appreciated by, Yours respectfully,

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The following is the petition of the Hardware Board of Trade of New York, with the list of signatures up to date:

The undersigned, business men and merchants, believing that restoration of confidence is absolutely necessary to avert further disaster, and that it is the duty of our legislators to do everything in their power to bring about such restoration of confidence, respectfully but earnestly urge upon Senators and Representatives at the extra session the following steps:

First.—That the purchasing clause of the Sherman silver bill be repealed.

Second.—That no substitute of any kind whatever be enacted at this session.

Third.—That an expert commission be appointed to consider and recommend a scientific plan of currency based on the experience of other countries and adequate to the requirements of a great commercial nation.

RUSSELL & ERWIN MFG. COMPANY,
PECK, STOW & WILCOX COMPANY,
WALLACE & SONS,
LAMSON & GOODNOW MFG. CO.,
EDWARD BECKETT,
JOHN G. WITTE & CO.,
W. COOK SMITH & CO.,
J. W. LAU & CO.,
ALFORD & BERKELE COMPANY,
STANLEY WORKS,
PATTERSON & HARRAL,
H. L. JUDD & CO.,
ALFRED FIELD & CO.,
TOWER & LYON,
SURPLESS, DUNN & ALDER,
J. C. MCCARTY & CO.,
SAMUEL G. WINTERNITZ & BRO.,
BURGER & BAUMGARD,
HENRY B. NEWHALL COMPANY,
UNION NUT COMPANY,
J. A. LYON,
FRANCIS T. WITTE HARDWARE CO.,
EAGLE LOCK COMPANY,
UNDERHILL, CLINCH & CO.,
MARTEN DOSCHER,
BRASS GOODS MFG. COMPANY,
TOPPING BROS.,
WM. H. JACOBUS,
G. I. MIX & CO.,
NORWALK LOCK COMPANY,
HUMASON & BECKLEY MFG. CO.,
WM. ROGERS MFG. COMPANY,
STEPHENS & CO.,
AUSABLE HORSE NAIL COMPANY,
VAN WAGONER & WILLIAMS CO.,
YALE & TOWNE MFG. COMPANY,
J. CURLEY & BRO.,
MALTBY, HENLEY & CO.,
C. F. GODFREY,
CHARLES M. RICHARDS,
FRASSE COMPANY,
F. R. EMMONS & BRO.,
BUTLER HARDWARE COMPANY,
GRAEF & SCHMIDT,
BRISTOL BRASS & CLOCK COMPANY,
FOSTER MFG. COMPANY,
C. F. GUYON COMPANY,
LIVINGSTON NAIL COMPANY,
KEARNEY & FOOTE COMPANY,
NATIONAL SAW COMPANY,
FRANCIS SPEIR,
W. & S. BETCHER,
SMITH, LYON & FIELD,
ADOLPH KASTOR & BROS.,
VOIGT, STARR & CO.,
READING HARDWARE COMPANY,
C. E. JENNINGS & CO.,
ALLERTON CLARKE COMPANY,
VOM CLEFF & CO.,
GRAEF CUTLERY COMPANY,

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SARGENT & CO.,
FULLER BROS.,
ROSS & FULLER ASSOCIATION,
MANNING, MAXWELL & MOORE,
ASHCROFT MFG. COMPANY,
POND MACHINE TOOL COMPANY,
HAYDEN & DERBY MFG. COMPANY,
TABOR MFG. COMPANY,
CONSOLIDATED SAFETY VALVE CO.,
MANNING & SQUIER,
PASSAIC ZINC COMPANY,
FULLER BROS. & CO.,
AMES PLOW COMPANY,
HARMER, HAYS & CO.,
HAYDENVILLE MFG. COMPANY,
TATHAM & BROTHERS,
HENRY HUBER COMPANY,
O. LINDEMANN & CO.,
KENNEDY VALVE MFG. COMPANY,
MEYER-SNIFFEN COMPANY,
T. MADDOCK & SONS,
HENDRICKS BROS.,
PECK BROS. & CO.,
DICKERSON, VAN DUSEN & CO.,
T. B. CODDINGTON & CO.,
ABENDROTH & ROOT MFG. COMPANY,
IRON CLAD MFG. COMPANY,
JERE ABBOTT & CO.,
LALANCE & GROSJEAN MFG. CO.,
CENTRAL STAMPINGCOMPANY,
N. Y. BELTING & PACKING CO.,
OKONITE COMPANY,
JOS. F. MCCOY COMPANY,
ATLAS TACK CORPORATION,
WILMOT & HOBBS MFG. COMPANY,
PLUME & ATWOOD MFG. COMPANY,
BENEDICT & BURNHAM MFG. CO.,
H. & D. FOLSOM ARMS COMPANY,
BRIDGEPORT BRASS COMPANY,
HOLMES, BOOTH & HAYDENS,
JOHN RUSSELL CUTLERY COMPANY,
E. BISSELL, SON & CO.,
JOHN H. GRAHAM & CO.,
HARMON & DIXON,
FRED. B. GURNEY,
CHAS. J. HEALY,
MILLERS FALLS COMPANY,
THOS. H. CHALMERS,
CHAS. J. STEBBINS,
HERMANN BOKER & CO.,
SCHOVERLING, DALY & GALES,
WATERBURY BRASS COMPANY,
SICKELS, SWEET & LYON,
MCNAB & HARLIN MFG. COMPANY,
CHAS. HUGILL,
WILLIAM JESSOP & SONS,
ST. LOUIS STAMPING COMPANY,
J. L. MOTT IRON WORKS,
HENRY P. WOOD,
W. & J. TIEBOUT,
WHITMAN & BARNES MFG. COMPANY,
GREENE, TWEED & CO.,
MERIDEN CUTLERY COMPANY,
HAWLEY BROS. HARDWARE CO.,
FRANKLIN BRASS & BRONZE CO.,
CRANE & HALPIN,
W. H. BELCHER,
T. F. CHERITON HARDWARE CO.,
W. B. FOX & BRO.,
AMERICAN WRINGER COMPANY,
H. C. MARSHALL,
BRUCE & COOK,
DUNHAM, CARRIGAN & HAYDEN CO.,
COOMBS, CROSBY & EDDY CO.

Prize Competitions.

THE COMMITTEE to whom the contributions in Prize Competition No. 21 were referred have awarded the prizes as follows:

First prize to H. L. Chaffee.
Second prize to John C. Perry.
Third prize to W. N. Stevens.

JOB T. PUGH of Thirty-first and Market streets, Philadelphia, manufacturer of Black Twist Bits and Augers, has received plans for the erection of a four-story brick building, opposite his present location, 70 x 70 feet. Building will shortly be commenced in the expectation of reaching completion in December, when Mr. Pugh will remove part of his present plant and install a new machinery plant, embodying the latest appliances for the speedy turning out of his line of goods.

Export Notes.

BRITISH CONSUL TALBOT of Taganrog, Russia, reports a large demand for agricultural machinery in the districts of Rostov-on-Don and Yeisk, in consequence of abundant harvests in the Caucasus. Russian-made goods of this class of cheap construction are said to be making great headway in the country, supplying lately a large proportion of the local demand. A good many American implements are disposed of in the provinces, especially Reapers, Mowers and Hay Rakes. Steam Threshers of English and German make are also widely used. Foreign-made Plows are being rapidly driven out of the market by cheap Russian implements.

An amusing example, as given by the *British Trade Journal*, of the efforts made to get the better of the customs tariff has been afforded by an attempt to introduce into Victoria a Grindstone free of duty as part of a Reaper and Binder. Where a detached article forms an integral part of some machine or apparatus not subject to duty it is admitted free. In this case the Grindstone is elaborately fitted with toothed gearing and cast-iron frame, with screw clamps for fastening it to a bench. Its ostensible use is to sharpen the knives of Reaping Machines, and on this ground it was put forward as part of a Reaper and Binder, but it could be used for the general purposes of a Grindstone, and forms no portion of the structure of the machine. It was about as much part of a Reaper and Binder as the whip that the farmer drives the horses with, and it was accordingly charged duty under its own class.

It is announced that an exhibition is to be opened at Porto Rico next November to commemorate the four-hundredth anniversary of the discovery of the Island, and exhibits of all kinds, and particularly agricultural and industrial implements and machines, are invited from all countries, "with the view of their becoming known and their employment introduced if proved adapted to the needs of the country." Space is to be granted free of charge, and must be applied for by September 1. Exhibits are to be admitted free of customs duty.

C. E. Geard of Geard & Co., Port Elizabeth, South Africa, is now in town *en route* to Port Elizabeth, having spent four weeks at Chicago seeing the exposition and several weeks around the rest of the country. His house is one of the largest in that territory. He says trade out there since he left has fallen off somewhat, having been excellent up to that time. This interval, however, is usually dull with them, and he anticipates a satisfactory business in September, October and November. Their severest trial came in 1885, and to a less degree three years ago, since when they have been doing a safe, conservative and remunerative business. His address in New York is with W. H. Crossman & Bro., 77 Broad street.

J. D. Cartwright of J. D. Cartwright & Co., Cape Town, Cape Colony, sailed for South Africa via Liverpool on the "Paris" July 26. This house does a large import trade with America in manufactures of Iron, largely through W. H. Crossman & Bro., New York.

William Brooker of Crooks & Brooker, said to be one of the leading importation houses in Adelaide, South Australia, arrived in New York recently on the "Havel," making this his first visit to this country. His mission here is a visit to the exposition, an acquaintance with American manufacturers and the looking up of desirable novelties. His headquarters while here will be with the Sherman & Lyon Company, 100 Chambers street.

William E. Peck, exporter, 64 William street, New York, has about 100 tons of Agricultural Machinery on Hemenway & Browne's vessel "Marmion" for Chilian ports, intended for the ensuing harvests.

Current rates for Chilian Exchange are about 14¾. Trade is, if anything, rather less than usual.

A leading export house in this city recently had the following advice from their London office: "We have an inquiry for Stair Carpet Fasteners (known here as Stair Buttons) which we are informed is an American idea. They are used to take the place of Stair Rods, and the parties from whom we have the information state that it is a very good invention. We shall be glad if you can obtain any information for us regarding this article." Inasmuch as these goods have been common in this market for upward of ten years, might not this hint be followed up in a general way, especially just at this time, in posting foreigners on many desirable goods suited to their requirements of which they may now be in need.

UNITED INDURATED FIBER COMPANY of New Jersey had their factory at Lockport, N. Y., destroyed by fire July 28. It was caused by an explosion in one of the bake ovens, resulting in the destruction of all their manufactured goods and stock in process, together with the building and machinery. It is their intention to rebuild at once, but so far as producing anything there it amounts to a total stoppage until a new plant is installed. Their factory at North Gorham, Maine, makes many goods of the same nature, so they are still in a position to partially execute orders, although since reducing the price on this ware in January of the current year, notwithstanding additions to their manufacturing facilities, they had but recently been in a position to execute orders promptly.

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Manufacturing.

E. T. FRAIM of Lancaster, Pa., manufacturer of Locks, has just commenced the building of a new brass foundry 60 x 42 feet. This has been rendered necessary by the growth of his business.

CLARK & COWLES, Plainville, Conn., manufacturers of Rivets and Burs and specialties in Wire and Sheet Metals, have recently added a new building and new machinery, which have increased their capacity by one-third.

THE WITHINGTON & COOLEY MFG. COMPANY, Jackson, Mich., shut down July 29 for the annual inventory and repairs. In most of the departments work will again be resumed August 7. The fork and hoe works of this company were established in 1848, and for a period of 45 years, we are advised, the wheels have turned every working day except during the short interruptions for annual inventories and repairs.

World's Fair Exhibits.

THOSE who may have occasion to consult recent issues of *The Iron Age* while in attendance upon the World's Fair will find a file of the paper at the exhibit of the Van Wagoner & Williams Company, which is located in the northeast section of Manufactures Building, in the quarter devoted to Hardware displays. The exhibit is in charge of L. T. Blue, who will extend to callers every courtesy when they wish to look over the pages of this journal.

HENRY DISSTON & SONS, INCORPORATED, of Philadelphia, have a very large exhibit in Machinery Hall, Section 14, Column F-34, consisting of the various articles manufactured by them. Their space is 35 x 17 feet, upon which they have erected five showcases, the largest of which is 18 x 16 feet and has a display of goods on each of the four sides. On one side of this large case they show a solid tooth Circular Saw, 60 inches in diameter, in motion. This is the size most used in the latest patterns of saw mills and is fitted up with their well-known gullet tooth. This Saw is surrounded by different patterns of Hand Saws and other general lines of carpenters' tools manufactured by this firm. Among the Hand Saws we note samples of their celebrated D8 pattern, their Acme No. 120, the No. 12 with polished and carved apple handle, and also their No. 7 Hand Saw, which is the standard Saw upon which they have built up their reputation. The reverse side of the case shows an inserted tooth Circular Saw, 60 inches in diameter, also in motion, and grouped around it are samples of Crosscut Saws, showing all the different styles of teeth manufactured. We note, among these, samples of Humboldt, California and Toledo Blade Crosscut Saws, which are made from a new process aluminum steel. These Saws are finely finished throughout and add greatly to the attractiveness of the display. On one end of the case is shown a set of Gang Saws fitted to a gate, illustrating the manner in which the Saws are used in a saw mill. On either side of this are large Banp Saws revolving over pulleys, and grouped in between are nests of small Circular Saws, which are also in motion, for the purpose of showing those not acquainted with the method of running the different patterns of Saws the manner in which they are used in manufacturing lumber of various kinds. In this large case over 800 pieces are used in the different designs. To the rear of the large case they have a showcase specially made for exhibiting Band Saws. These Saws are shown in coils as shipped from the factory, and on the lower part of the case are two 12-inch-wide Band Saws, which is the largest size made. On the upper part of the case are ten coils of narrower widths of Band Saws, with two groups of nine saws each. These Band Saws are all made of Disston's celebrated aluminum steel, which is claimed to be the best metal for this purpose that has yet been produced and which is manufactured exclusively by them. Over 2000 feet of Band Saws are used in this exhibit. Henry Disston & Sons are among the largest manufacturers of Files in the United States, and in connection with their exhibit of Saws, &c., they have three cases of Files, which are arranged in attractive designs showing all the various shapes, sizes and cuts known to the trade. There are in all about 3000 different pieces used in this display, including all shapes and sizes, from a large 18-inch flat File for heavy, rough iron work to the small 3-inch taper saw File used in sharpening Hand Saws and other small work. The exhibit also includes a very fine display of manicure Files in all shapes demanded by this special line. These are arranged in attractive designs, assisted in effectiveness by the carved ivory handles with which some of them are finished. Disk Files are shown in all sizes and for various uses. Another noteworthy exhibit among the Files comprises Files of semicircular shape. These were invented for use in the company's works in special machines for finishing Saws, but are shown here to demonstrate the comprehensive character of the File works. The cases are built in a very attractive manner, the larger case having a dome roof surmounted by a large American eagle in gold. The wood work is painted a rich maroon color with gold finish, adding very much to the beauty of the brightly finished steel tools. The interior of the large case is fitted up in hard wood as an office, where a representative of the firm takes pleasure in answering all questions. The entire display is a most handsome one and reflects great credit on the exhibitors. They have for distribution numerous cards, pamphlets and price-lists illustrating the different articles manufactured.

STANLEY WORKS of New Britain, Conn., and New York make an exhibit in the Manufactures Building of Wrought Steel Hardware exclusively. The articles shown consist of Wrought Steel Butts, Hinges, Blind Trimmings, Barrel and Square Bolts, &c., and Wrought-Steel Drive Chain. These are exhibited in upright showcases and in a counter showcase. The display of Corrugated Butts is particularly comprehensive, covering a great variety of Butts for heavy and light work. The general line is shown in all kinds of finish—electro-plate, bronze, old copper, silver, &c., but taken directly from regular stock, except a very large nickel-plated Hinge, 2 feet square, which was first shown at the Centennial Exposition in Philadelphia. The Drive Chain, which has but recently been put on the market, is similar in design to the ordinary Malleable Drive Chain, but is made of wrought steel. The links are detachable. This Chain is made in any size of link desired, for either heavy or light work. Special machinery has been perfected for its manufacture. Another new article is a Hinge with ball bearings in the washers. This has been designed particularly for heavy doors, which cause considerable wear on ordinary butts. The company can match any Hardware in the market in the finish of their Butts.

THE ADAMS & WESTLAKE COMPANY of Chicago make an Oil Can exhibit which is a conspicuous feature of the part of the Manufactures Building in which it is located. The Oil Cans are arranged in the similitude of the United States flag, red Cans alternating with white Cans forming the stripes, and blue Cans with stars painted on them forming the field. It is a huge piece of work, towering high in the air. On the floor, on one side of the flag, are specimens of decorated Water Coolers and Pan-American, Pinafore, Little Joker, Rockaway and Standard household Oil Cans. On the other side are Mann's Flour Sieves, Imperial Sifters, &c. The Adams & Westlake Company have also an exhibit of fine brass Bedsteads in the furniture section of the Manufactures Building, while in the Transportation Building they have erected an artistic booth in which are displayed Lamps for lighting railroad cars and a variety of car trimmings in brass and other metals.

IRON CLAD MFG. COMPANY of New York make an exhibit of a unique character, entirely original for this occasion. They have a large square space, inclosed by a heavy nickel-plated railing. Above this is a frame work, with columns made of Milk Cans for bases, supporting ironclad, cold-weld Boilers, on top of which are small Milk Cans, surmounted by still smaller city delivery cans. These columns are connected by cross pieces, on which are hung small wares, such as Tea and Coffee Pots, Drinking Cups, Dippers, Spoons and Kitchen Utensils generally. Pipes also run from the columns to a central vertical pipe, 28 feet high, and are used to support cross bars, from all of which hang numerous specimens of the company's kitchen utensils, enameled in various colors. From the top of the central pipe hang wires, to which are fastened metal letters forming the name of the company. There are three entrances, over each of which springs an ornamental archway, with the word "Ironclad" in white enameled letters in the center. The Milk Cans supporting the columns are of different patterns, illustrating the styles in use in several cities. The Boilers are of a new and exclusive pattern, recently put on the market by the company. They are not riveted, but are welded cold, even the heads being put on without rivets. These are tested to 500 pounds, and are guaranteed to stand any water pressure in America. Inside the inclosed space are a number of tables, on which are a great variety of specimens of the company's enameled goods, while on the floor stand many patterns of Milk Cans. The whole of one side of the inclosure is covered with large plate glass mirrors, in a fine cherry frame, with the company's name overhead in white enameled letters. This exhibit is of such a distinctive character that it attracts unusual attention. It is located in the Manufactures Building.

BOMMER BROTHERS, 351 and 353 Jay street, Brooklyn, N. Y., make a very attractive exhibit of their Spring Hinges in the Manufactures Building. They have built a very elaborate framework of solid mahogany, handsomely carved, in which are set panels covered with blue plush to which samples of Hinges are attached. These are shown in various sizes and in all finishes, to match any Hardware. Some are triple gold plated, being specimens of work recently turned out for very expensive houses. Others are curiously mottled, to conform with the requirements of export orders just filled for France and Germany. Very large double-acting Hinges are shown, which are warranted to carry the heaviest door without injury. A special feature of the exhibit are some very large solid mahogany doors, magnificently made, one of which is hung with Double and

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the others with single acting Hinges. Instead of the usual panels in these doors are small doors hung with small double or single Hinges to correspond with the large ones. The firm have recently begun the manufacture of wrought Hinges of all metals, except wrought iron, greatly increasing their strength.

DEAL & BRENIZER of Canton, Ohio, are located in the Manufactures Building and exhibit an entirely new Lock, called Deal's Columbian Lock. This is a combination Lock, requiring no key. Two sizes have been put on the market up to date. Of these, the larger is used as a Padlock and the smaller as a bicycle Lock and for similar purposes. It consists of a body cylindrically shaped, but made up of a number of revolving disks with fixed plates between them. The disks have projections by which they are turned. A hole extends through the center into which a shackle is run notched to correspond with the disks. The Lock is operated by turning the disks. It is susceptible of unlimited combinations and can be opened in the dark as easily as in the light. Other sizes will shortly be made.

WILSON BOHANNAN of Brooklyn, N. Y., makes an exceptionally fine exhibit, unique in its character, and therefore specially attractive. It is located in the Manufactures Building. In the center of an oblong space, carpeted and surrounded by a heavy brass railing, stands a huge padlock with a heavy brass frame and glass sides, forming a showcase. It is lined with blue silk, making a pretty setting for a good display of Padlocks, Cabinet Locks, Mortise Locks, Keyless Cabinet Locks, &c. These goods are most exquisitely finished, and are attractively arranged in the case. It stands on a large brass rest with four legs terminating in claws. The fine showcase is a work of art in itself.

SMITH & WESSON of Springfield, Mass., have devoted unusual pains to making a fine exhibit of their Pistols in the Manufactures Building. They have three large oak showcases filled with very handsome specimens of their goods. Among these are ten Pistols decorated by Tiffany & Co., the value of which ranges from $160 up to $425. One pistol, finished by their own engraver, is much more elaborately finished than these and is probably worth about $2000. It is heavily inlaid with gold, from the tip of the muzzle to the end of the stock, and occupied a workman's time for a whole year. The scroll work is of a different character from that usually done. The metal has been cut out of the stock and barrel, leaving the scrolls in relief. The gold work is inlaid lower than the steel. A new Pistol is shown, which is intended for target practice. It is a single-shot breech loader, made from 22 to 38 caliber, and in three lengths, from 6 to 10 inches long. The stock is of hard rubber. There is an adjustable rear sight and it is fitted with the Payne front sight. They also exhibit specimens of their new lubricating Bullet, recently illustrated in these columns. In addition to Pistols, the firm manufacture a revolving Rifle. It is a large Pistol with an extension stock and a 16-inch barrel. It is a six-shot and is of 32 caliber, making quite a formidable weapon. The revolvers made by the firm are usually five-shot, while the largest calibers are six-shot.

WINCHESTER REPEATING ARMS COMPANY of New Haven, Conn., are located in the Manufactures Building, where they make a large exhibit of their Repeating Rifles, Carbines, Shot Guns, Infantry Muskets, Cartridges, Loading Tools, Cannon Cartridges and Projectiles. These are shown in great glass cases extending around three sides of the company's space. The Guns are arranged in upright cases, some being in stacks and others fastened separately to the back of the case. The variety of the Guns shown is very large, and all are labeled to enable visitors to obtain a correct idea of the character of the exhibits. Two upright cases are devoted to center-fire and rim-fire Cartridges, arranged methodically, according to size, on glass shelves with a mirrored background. Horizontal showcases at the base of the large cases contain Loading and Cleaning Tools, Percussion Fuses and Primers, Projectiles for small Cannons, &c. In some cases these Projectiles have been cut to show their interior construction. In each of these horizontal cases is shown also a very fine specimen of the latest models of Repeating Guns, supported on neat nickel-plated stands. In the center of the space is a case containing models of the solid drawn and solid head brass Cartridge Cases for the 8-inch and 6-inch high-power rapid-firing cannon of the United States Navy, manufactured by this company. They are superb specimens of skill in the production of large brass Shells with remarkably thin metal in the rims and head. A 4-inch plate of steel is also shown, perforated by the 6-pound Projectiles, which is the United States test for Projectiles of this character.

THE UNION METALLIC CARTRIDGE COMPANY of Bridgeport, Conn., in the Manufactures Building make a display exclusively confined to cartridges. The largest sizes, for rapid-firing cannon, are shown attached to a huge frame covered with maroon-colored cloth inclosed in a border of oak molding and are also shown on pyramidal platforms standing at both ends of the frame. Brass shells are separately shown to exhibit the accuracy with which the metal has been drawn into shape. A horizontal showcase is filled with specimens of smaller Cartridges for guns, comprising a large variety of ammunition of this character. There are also specimens of the company's cardboard and white felt wads. The display is an excellent one and has been designed very well. A decided compliment has been paid to the ammunition of this company by its recent adoption for exclusive use at Buffalo Bill's Wild West show, repeated tests having shown that it was impossible to ball the shot or fuse them into a solid mass when firing.

COLT'S PATENT FIRE ARMS MFG. COMPANY of Hartford, Conn., make a handsome display in the Manufactures Building of their fine Pistols and Guns in two cases. One is a large elegantly carved upright case, inclosed with a single pane of plate glass in the sliding door. A portrait of the founder, Col. Samuel Colt, is in the center, surrounded by Revolvers of exquisite finish, breech-loading Guns, parts of Revolvers, &c. The other case is considerably smaller with a number of Guns stacked in an upper compartment and Pistols in a lower compartment, all fine goods. A Gatling Gun occupies a conspicuous position on the floor in front of the large case.

F. BANNERMAN, 27 Front street, New York, whose armory is in Brooklyn, shows a large number of his Spencer Repeating Arms in the Manufactures Building. These are arranged in racks in upright cases, and are appropriately labeled to indicate their special characteristics. The feature of this exhibit is the 1890 model of the Spencer Repeating Shot Gun, which can be fired six times in three seconds. It is made in four lengths of No. 12 gauge. The magazine is located under the barrel, and is made to hold five cartridges. Shells are ejected automatically, fresh cartridges taking their places until the magazine is exhausted. The barrels are either choke or cylinder bore. It is claimed that there is no possibility of a premature explosion. Having very few parts it is very durable.

THE REMINGTON ARMS COMPANY of Ilion, N. Y., illustrate in their exhibit the extent to which Remington Rifles have been supplied to many nations throughout the world. Stands have been constructed, revolved by an electric motor, which are filled with Guns in racks. At the base of each Gun is a card stating the country for which the Gun was made and the size of the order. The exhibit thus made is further exceedingly interesting, as it illustrates the differences in taste in different countries with regard to lengths of barrel, shapes of stock, kind of bayonet, &c. Among these Guns is a specimen of the Lee-Speed Gun, of which 400,000 have already been manufactured in England for the British Army. In an upright case are shown numerous specimens of the Fowling Pieces, Target Rifles, &c., made by this company, embracing a large line of sporting goods. In addition to the Gun exhibit in the Manufactures Building, the company make a display of Bicycles in the Transportation Building.

THE BURGESS GUN COMPANY of Buffalo, N. Y., exhibit the new Burgess 12-gauge Repeating Shot Gun. This is made in several grades to meet the demand for very fine Guns, as well as those of a moderate price. It is a six-shooter, with a magazine under the barrel holding five cartridges. There is a sliding pistol grip movement, and the barrel can instantly be released from the stock. It is claimed that this is the only repeating Gun made which can be thus instantly taken apart. A special arrangement is made by which a hang-fire shell cannot be exploded in the face. This is called a safety recoil unlocking catch, and it is automatically operated by the stock or recoil of firing the piece. There are a number of other very interesting points in the mechanism of the lock which cannot well be explained without cuts to illustrate them. The company having but recently begun to manufacture Guns they have thus far turned out only Shot Guns, but will soon be making sporting Rifles, repeating automatic Pistols and military arms.

THE C. C. BROOKS ARMS & TOOL COMPANY of Portland, Maine, exhibit the Brooks Repeating Rifles and Shot Guns in the Manufactures Building. They have made their exhibit attractive to sportsmen by the addition of mounted moose heads, full antlered. The Brooks Guns comprise single and double Shot Guns, three-barreled Guns, single-shot Rifles, Magazine Rifles and Target Pistols. The three-barreled Gun is a combination of a double-barreled Shot Gun and a single-shot Rifle. All these Arms are furnished with the automatic ejector, which returns to its place flush with the end of the barrel after ejecting shells, so that shells are inserted and pushed home at one motion, and also making it impossible to hit the firing pin in closing the Gun.

THE MARLIN FIRE ARMS COMPANY of New Haven, Conn., make a very extensive exhibit of Repeating Rifles and Revolvers. In a large semicircular upright case, graced with magnificent deer heads, they show no less than 150 samples, none of which are duplicates. This is claimed by the company to be the largest display ever made in this line. The Guns range from 5-shot to 25-shot pieces, those of smallest caliber having the largest magazines. These

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samples are fitted with remarkably handsome stocks, comprising a great variety of woods, beautifully carved and exquisitely polished. The locks are engraved in original and very artistic designs, the company having facilities to reproduce any special design, picture, &c., that may be desired by a purchaser. Some very ornate designs are shown which have been brought out to suit the tastes of Spanish buyers. Among the recent novel designs are locks embossed with the metal cut out, leaving the design in relief, and engraving in silver with the engraving showing in black against the polished background. There are military guns made of light weight for use by Chinese and other nations of small stature, also ladies' guns, with short barrels and beautifully finished locks and stocks, carbines of the latest design, &c. The company show quite a novelty in gun catalogues, namely, a catalogue in the Chinese language, illustrating and describing their goods in full. The exhibit is located in the Manufactures Building.

Price-Lists, Circulars, &c.

UNIVERSAL SAD IRON COMPANY, Milwaukee, Wis.: The Universal Sad Iron. Small sheets in the shape of the Universal Sad Iron, held together by an eyelet, the outside sheets having colored illustrations of the article, are sent out with the compliments of the company. Description, list prices and other information are contained within the covers in a compact and comprehensive manner.

ODELL HARDWARE COMPANY, Greensboro, N. C.: Illustrated pamphlet No. 8, of 84 pages, devoted to Farming and General Store Goods, including Plows, Barrows, Road Scrapers, Cultivators, Hoes, Steel Fencing, Shovels, Spades, Rakes, Chains, Refrigerators, Wire Goods, Screens, Lawn Mowers, Pumps, Freezers, Cider Mills, Wringers, Hammocks, Milk Shakes, Ice Shaves, Fly Traps, Lawn Sprinklers, Barb Wire, &c. A general Hardware list is issued in addition to this.

THE PLUME & ATWOOD MFG. COMPANY, New York and Chicago: Royal Lamps, Brass and Copper Goods. The catalogue devoted to Lamps is an artistic production of convenient size, and illustrates Royal Lamps in a variety of kinds and styles. The catalogue referring to Brass Goods gives price-lists of Brass in various forms, Brass and Copper Wire, Copper Rivets and Burs, Brass Butts, Chain, Ferrules, Curtain Rings, Heel Plates, Box Rings, Bells, Drawer Pulls, Banner Lamps, &c.

A. F. SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo: Fall Catalogue of Seasonable and Holiday Goods. The book contains 56 pages and illustrates Axes, Saws, Scoops, Corn Shellers, Family Grist Mills, Huskers, Pearl Agate Ware, Puritan Ware, Hollow Ware, Meat Cutters, Stove Boards, Shovels, Tongs and Pokers, Coal Vases, Dampers, Electric Bell Sets, Registers, Skates, Sleigh Bells, Sleds, Bicycles, Clocks, &c.

E. F. REECE, Greenfield, Mass.: Screw Cutting Tools. The Reece Improved Hand Bolt Cutters or Screw Plates are illustrated with descriptions and prices in a catalogue. These, with interchangeable tap and die holders for Bit-Brace, &c., are designed for blacksmiths' and machinists' use. Stock, Tap Wrench, and Tap and Dies are put up in sets in cases, of a variety of sizes, adapted for various kinds of work.

Trade Items.

THE DENVER HARDWARE COMPANY, Denver, Col., filed an assignment July 28 in the County Clerk's office. James A. McClurg is made assignee.

PARKHURST & WILKINSON, Chicago, confessed judgment on July 24 in the local circuit court in favor of the Continental National Bank of Chicago, for $87,175.15. The debt is evidenced by judgment notes, which the defendant concern were unable to meet at maturity. An assignment was afterward made to the Chicago Title & Trust Company. The firm's assets are estimated at $1,000.000.

H. H. MAYHEW COMPANY, Shelburne Falls, Mass., besides goods of their own manufacture, which include Screw Drivers, Bits, &c., are also sole selling agents for the well-known Goodell specialties, Goodell's Automatic Screw Drivers and Automatic Drills. No 3 of the latter is shown in their advertisement in this issue.

PIKE MFG. COMPANY, Pike Station, N. H., have removed from 107th street and First avenue, New York, and now have their own representative at 113 Chambers street, where they carry a complete stock of everything made at their factories.

THE ADVERTISEMENT of the Mannesmann Tube Company, Landore, South Wales, England, for whom D. B. McIlwaine, 111 Chambers street, New York, is agent, will be of particular interest to users of Tubes for cycles, boilers, hydraulic work, well boring, &c. The Mannesmann Weldless Steel Tubes are referred to as being rolled direct from the solid bar and as having a spiral fiber.

NELSON B. KEYES, manufacturer of Patent Solid Steel Wire Pliers and Cutting Nippers, for whom C. J. Healy, 106 Chambers street, New York, is sole agent, has just completed a new factory and added new machinery which will double his former capacity.

ROBERT STOPPARD, Auburn, N. Y., calls the attention of the trade, through his advertisement, to the Auburn Ice Tongs, manufactured exclusively by him. Quality, workmanship and price are among the points of excellence which he claims for these goods.

WHITMAN & BARNES MFG. COMPANY, 102 Chambers street, New York, with factories and branch houses in various parts of the United States as well as in England, France and Canada, have recently bought of the Capitol Mfg. Company, Chicago, Ill., all rights, patents, &c., in connection with the Acme Wrench. This line of Wrenches will hereafter be made by them at their new shops in West Pullman, near Chicago.

THE BRONSON SUPPLY COMPANY, 90 Beekman street, New York, are about to add the product of two or three new factories to their present line for the fall trade. The articles are of a kindred nature to what they now handle. The Bronson Supply Company have a full stock of their Never Break ware on hand, and will thus be in a position at the beginning of the fall season to fill all orders promptly.

VARE ANVIL COMPANY, Trenton, N. J., are marketing an Anvil made by a patented process, which has a cast-iron base, a steel-face plate and a wrought-iron horn plate. In alluding to the features of this Anvil the company refer to the steel for the face as of the best quality, tempered the hardest where the heaviest blows fall, while the edges are so tempered as to prevent them from breaking off. The base of the Anvil is said to be made of the best selected iron, the Anvil being cast in one solid piece, the steel-face plate being welded to the iron when the casting is made. At present these goods are supplied in six sizes, ranging from 100 to 200 pounds. The sole agents for these goods are G. W. Van Tine & Son, Philadelphia, Pa., represented in New York and on the road by F. S. Harrison, 90 Chambers street, this city.

THE BUSINESS OF THE AVERY STAMPING COMPANY, Cleveland, Ohio, was placed in the hands of a receiver Wednesday, July 26. Application for the appointment of a receiver was made by the Junction Iron Company of Steubenville, and Douglas Perkins was unanimously requested to be appointed receiver. The assets of the company are placed at upward of $400,000 and the liabilities at $300,000. The officers of the company are Ralph A. Harman, president; Douglas Perkins, vice-president; Joseph Perkins, secretary and treasurer, and Henry W. Avery, manager. President Harman in an interview said that in ordinary times the company have had no trouble, that on July 1 their balance sheet showed assets amounting to $505,000 and liabilities $296,000 and their business was prospering until it became difficult to obtain ready money. Upon consultation with the Junction Iron Company they decided to take action toward keeping the business in their own hands rather than assign it absolutely to another. President Harman said that he hoped that matters would be adjusted so that operations would be resumed about the middle of August.

THE INTERCHANGEABLE TOOL COMPANY, Boonton, N. J., manufacturers of Hollis Patent Cutting Nippers and Pliers, have, for the benefit of near-by trade, established an agency with W. W. Pryor & Co., 81 Chambers street, New York, where a full stock of their goods will be kept and the trade supplied at factory prices.

H. M. NORTON & Co., Chester, Conn., for whom W. W. Pryor & Co., 81 Chambers street, New York, are agents, are about to place on the market a new Bell-Hangers' Bit, which, it is claimed, will do the work required of it more quickly than the pattern now in use.

COVERT'S SADDLERY WORKS, Farmer, N. Y., call the attention of the trade in their advertisement to their 15-cent Halter. The manufacturers state that the manner in which the Halter is constructed avoids the necessity of stitching or riveting, and that the tie is very secure and complete.

C. ROGERS & BROS., Meriden, Conn., will start a new branch of the Flatware business this fall, and one that will give employment to between 40 and 50 hands. They have recently erected a 50 x 30 foot brick building, and will make their own steel Knives instead of buying them, as heretofore. The company for the past eight months have been making steel Forks from the sheet metal to the placing of them, plated, burnished and buffed, on the market, and when the new department is running the steel Forks and Knives will be made there. The purpose of the firm is to keep the German silver and the steel goods separate. The new building is four stories high, well lighted and ventilated, and has all modern factory equipments for the comfort and safety of employees. The firm will soon put in an automatic elevator in their main building.

THE W. H. CHAPMAN COMPANY of Middletown, Conn., manufacturers of Saddlery Hardware, &c., have reduced the number of working days at their factory to three a week.

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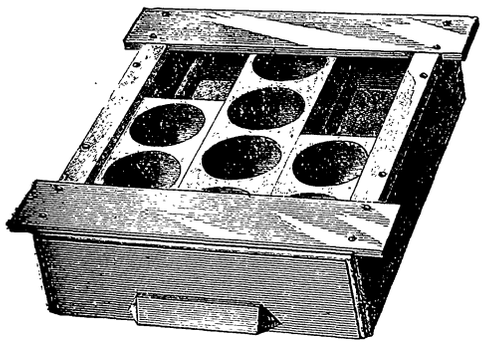
Waddel's Improved Money Drawer.

Waddel Wooden Works, Greenfield, Ohio, are introducing an alarm till, as illustrated herewith. The till is provided with eight coin hoppers, four of which slide, and with four compartments for paper money. The manufacturers claim the desirable feature of the drawer to be in the simplicity of the combination lock, which is represented as being susceptible of 32 changes. It is explained that no springs are used in the lock, which is composed of five latches and a single catch, the latches being hung on a wire



Waddel's Improved Money Drawer.

pin firmly braced, and so constructed that by reversing them a different combination is made. A steel gong is used for the alarm, which is sounded when the drawer is opened about an inch.

Steel Tape with Temperature Compensating Scale.

Keuffel & Esser Company, 127 Fulton street, manufacturers and importers of drawing materials, surveying and mathematical instruments, are offering an improved steel tape, with temperature compensating scale, as shown in Figs. 1 and 2. These tapes are intended for accurate measurements in the field, for bridge work, new buildings, &c. Sixty-two degrees F. being the temperature designated standard by the Office of Weights and Measures of the United States Coast and Geodetic Survey, comparisons of steel measures are made at this temperature. Fig. 2 represents the last two inches of a 100-foot steel tape ½ inch wide, divided into tenths and hundredths, by means of which the correction for temperature may be made while a measurement is being taken, dispensing with subsequent calculations. The large figure 9 determines the division $99\frac{9}{10}$ feet; to the right of this are seen six subdivisions of $\frac{1}{100}$ foot each, then follows a short but finely graduated scale from 120 down to 0 and on to — 20. This is a thermometric scale, made in accordance with the co-efficient of expansion 0.000006 for each degree Fahrenheit and based upon 100 feet, the total length of the tape. The 100-foot figures are placed at 62° of this scale, a short line on the lower edge of the tape indicating exactly its position. If the temperature of the tape when being used were 80° F., then, since the tape will have expanded by reason of the additional heat, the 100-foot length division will be in reality at 80 of the small scale, while if the temperature of the tape were reduced to 40° F., as the tape will have contracted, the 100-foot length division will be in reality at 40 of the small scale. If it be required to measure a shorter length than 100 feet, then the correction must be made by means of the formula; thus for a length of 80 feet and a temperature of, say, 92° F., we have 80 + (0.000006 × 30° × 80) feet = 80.0144. Fig. 2 represents a Columbia Excelsior steel tape in bent leather case with patent folding flush handle, with scale on the inside end. These tapes are made in feet divided in tenths and twelfths, also with links and meter.

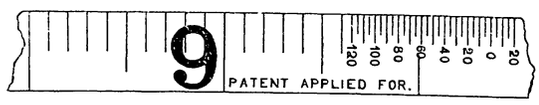


Fig. 1.—Last 2 Inches of 100-Foot Steel Tape.

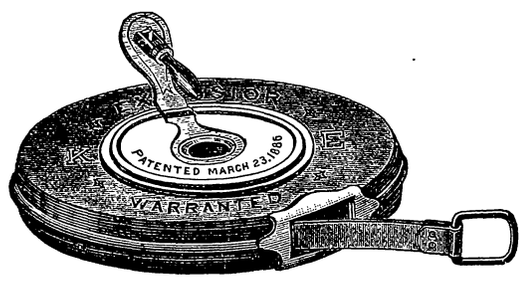


Fig. 2.—Columbia Excelsior Steel Tape with Folding Handle.

Rawhide Ferruled Mallets and Chisel Handles.

Syracuse Specialty Mfg. Company, Syracuse, N. Y., Surpless, Dunn & Alder, 97 Chambers street, New York, direct representatives, are marketing rawhide ferruled mallets and chisel handles, as here shown in Figs. 1, 2 and 3. Fig. 1 represents a mallet ready for use, the heads and handle being of selected maple. The faces are of vulcanized fiber and the ferrules of rawhide. This method is said by the makers to combine strength, elasticity and durability, and the point is made that when after much use the fiber wears down so that a tool is liable to be hit by the ferrule, the rawhide ferrule will not injure it. Fig. 2 is a sectional view of the mallet. Fig. 3 represents a hickory framing chisel handle, with a rawhide ferrule wound in successive overlapping layers. Tanged firmer and socket firmer chisel handles are also treated by the same process.

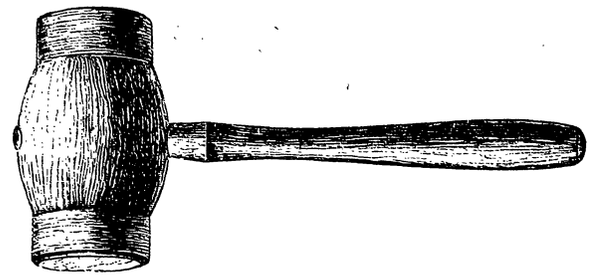


Fig. 1.—Mallet with Rawhide Ferrules and Fiber Faces.

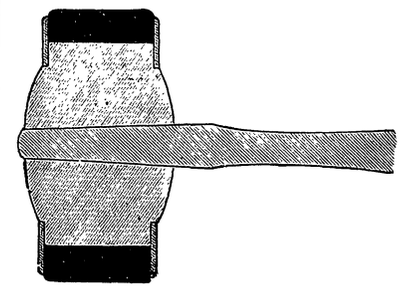


Fig. 2.—Sectional View of Mallet.

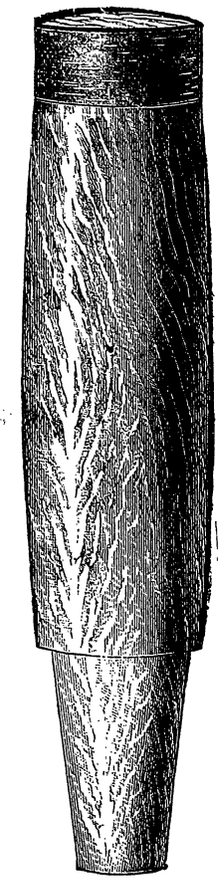


Fig. 3.—Framing Chisel Handle with Rawhide Ferrule.

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The Monroe System of Refrigeration.

The Monroe Refrigerator Company, Lockland, Ohio, the West & Tice Company, 139–141 West Fourth street, Cincinnati, agents, are introducing a system of refrigeration in their No. 5 refrigerators, as shown in the accompanying cuts. Fig. 1 shows the interior construction of the refrigerator, while Figs. 2, 3 and 4 represent cross sections of the apartments, the numbers of the cuts indicating the position the apartments occupy in the refrigerator. The top apartment is provided with ice rests upon which the ice is placed. The system of refrigeration is explained as follows: The air becoming chilled and heavy passes down the air flue D, as indicated by the arrows in Fig. 1, and into the provision compartments of the refrigerator, forcing the warmer air upward through the air spaces 1, 1^1, 1^2, 1^3, 1^4 and 1^5 in front and behind the provision compartments in Figs. 3 and 4, to the return flues 1^6, 1^7, 1^8 and 1^9 in Fig. 2; through which it continues to the top of the ice apartment, as indicated by the arrows at the top of Fig. 1, to the ice where it is chilled and passes down through the flue D, thus keeping a continuous circulation so long as there is ice in the refrigerator, causing the entire atmosphere within the refrigerator to pass over the ice every few minutes. It is stated that all vapors and minute particles given off by the food are thus carried to the ice where the vapors are condensed and the minute particles deposited and carried off by the drippings which pass down the sides of the flue D, and out of the refrigerator through the drip pipe and trap O. The point is made that as all vapors are condensed on the ice the provision compartments are free from sweating and that matches could be kept in them in perfect condition for any length of time; also that the water from the ice, in passing down the walls of the air flue, assists in cooling the refrigerator, thus utilizing every particle of ice. The trap at the bottom of the refrigerator is to form a water seal to prevent air or heat from entering through the drip pipe. The manufacturers claim that the movement of the air in the provision compartments being only from the bottom of the refrigerator upward, there will never be any mixture of flavors or tastes if all food likely to give off odors is placed in the top compartments, as the air from these compartments passes over the ice and is purified before it again enters the other compartments; also that by the air being conducted directly from the ice to the lowest parts of the refrigerator before it enters the provision compartments, a low temperature is secured at the greatest distance from the ice, hence the lowest possible temperature throughout the refrigerator.

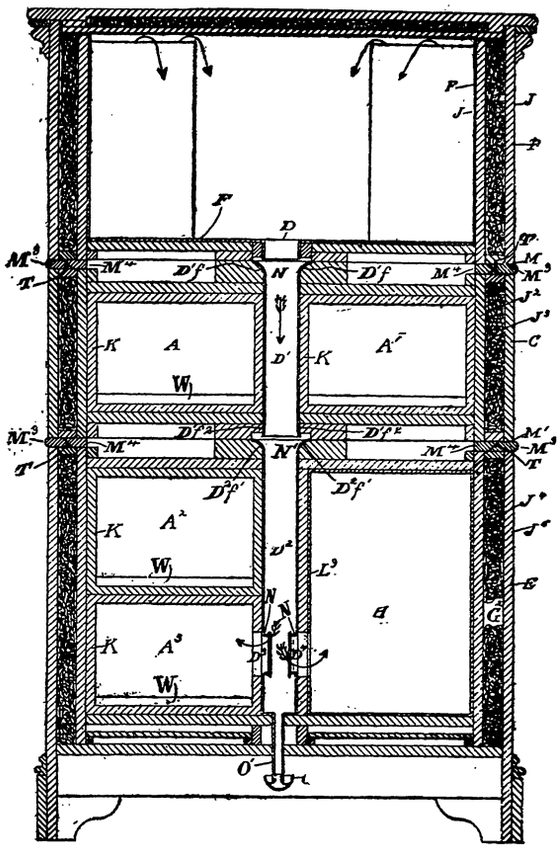


Fig. 1.—Interior of Refrigerator.

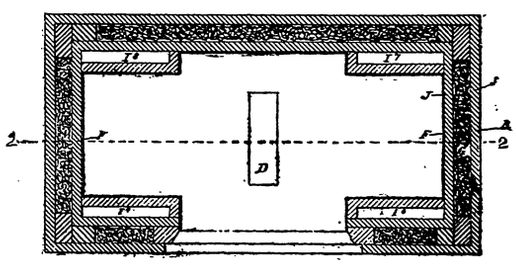


Fig. 2.—Ice Chamber.

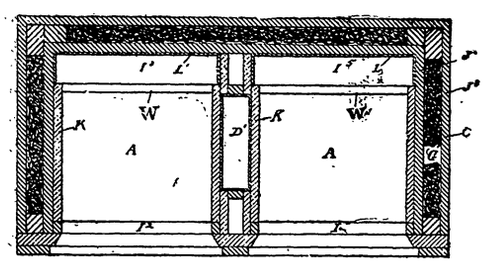


Fig. 3.—Apartment Under Ice Chamber.

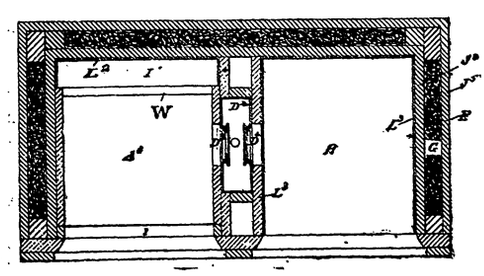
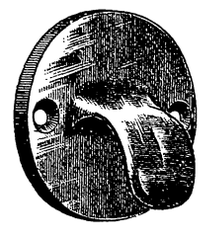


Fig. 4.—Bottom Apartment.

New Design Sash Lift.

The Self-Acting Bell Company, Lancaster, Pa., Surpless, Dunn & Alder, general agents, 97 Chambers St., New York, are introducing a sash lift as here shown. It is cast in one piece, the base being round and the finger hold in the center. The dimensions are: $1\frac{1}{2}$ inches diameter, $\frac{7}{8}$ inch from back to front, and $\frac{15}{16}$ inch space under the lift. It is made in solid bronze, bronze plated, copper plated oxidized and Boston bronze, put up with oval screws.



Finger Sash Lift.

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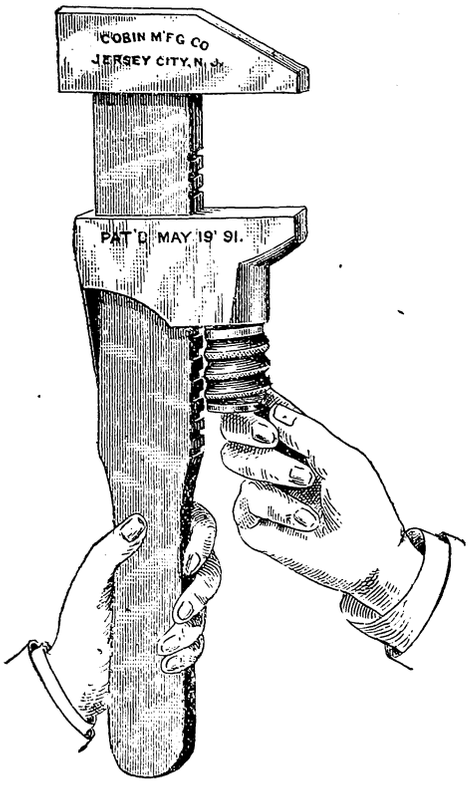
Adjustable Wrench.

Cobin Mfg. Company, 107 Chambers street, New York, have brought out a wrench, as here shown, which, at present, is being made in the 5 inch size for bicycle and similar purposes, but which later they expect to furnish in all the regular sizes to 15-inch inclusive. The principal feature to which the company call attention is the ease and rapidity

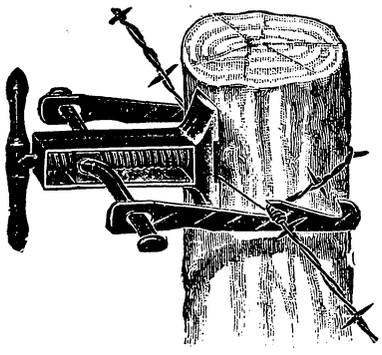


Adjustable Bicycle Wrench.

with which the movable jaw can be adjusted to any size within its capacity. A flat steel spring, riveted to the back of the movable jaw, permits the screw to be pulled out, so as to release it from the grooves in the bar, while a close adjustment is effected by turning the screw to right or left. It can be used either as a ratchet or screw wrench. We are advised the bar is drop forged from bar steel and case hardened. The wrenches are made both bright and nickeled.

Chicago Wire Fence Tension Machine.

The accompanying illustration represents a tension machine put on the

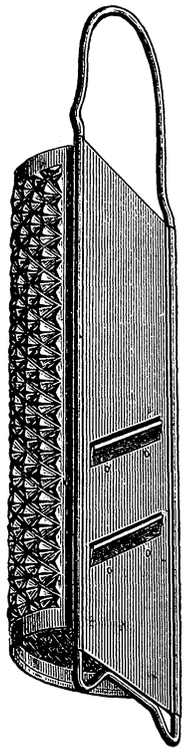


Chicago Wire Fence Tension Machine.

market by the Chicago Spring Butt Company, Union Park place and Carroll avenue, Chicago, Ill. The machine consists of a slotted post made of gray iron, and a cross bar, on each end of which is hung a double-hooked steel plate. A threaded rod with a T handle passes through the end of the post, and also through the threaded eye of the cross bar. In operation the foot of the machine is placed against the side of the fence post, on the side opposite the fence wire. The steel hooks, which straddle the fence post, are engaged with the wire and the screw is turned sufficiently to tighten the fence wire properly. The fence wire is fastened in this position by a piece of plain wire, which can be run under the foot of the machine, through an opening made for that purpose. The machine is designed for taking up the slack in wire fences caused by the expansion or stretching of the wire. The manufacturers state that a boy can operate the machine, using scraps of soft wire for tying, and that as no staples are used the wire is held as firmly on decayed posts as on sound ones.

The Spery Combination Grater and Slicer.

Chicago Hardware Specialty Company, 149 Lake street, Chicago, are introducing the above article, as herewith



The Spery Combination Grater and Slicer.

shown. The article is made of the usual sheet grater, having, however, a galvanized-iron back, in which are inserted two steel knives for slicing. The blades can be taken out for cleaning, or to be used separately. The manufacturers state that the article is strong and durable and that its combination is desirable.

Secretary Herbert has appointed a board of naval experts to make a competitive test of magazine rifles to determine which is the best weapon for our sailors and marines. The navy officials think that American inventors can produce a better arm than the Krag Jorgenson rifle.

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Current Hardware Prices.

AUGUST 2, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—
Domestic.....℔ doz $3.00, 33⅓%
Excelsior....℔ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—
Eagle Anvils, ℔ ℔ 9¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe brand.11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co..... 33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—
Common Augers and Bits.....70@70&10%
Boring Machine Augers.....70@70&10%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits.25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&5%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ℔ set, 32½ quarters, No. 5, $5; No. 30, $3.50.25%
Lewis' Patent Single twist.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—
Morse Twist Drills..... .50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ℔ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $18.....35@40%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common.....℔ gross $2.75@$3.25
Diamond.....℔ doz $1.25.....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's.....
℔ gro., $10.00...40&10%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—
Ives'.....
French, Swift & Co. (Beecher).....
Douglass'.....
} 33⅓@33⅓ &10%
Bonney's Adjustable, ℔ doz $48.....50%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....25@25&10%
Snell's.....25@25&10%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—
Awls, Sewing, Common....℔ gr. 85¢@90¢
Awls, Shoulder. Peg.....℔ gr. $1.50@$1.55
Awls, Pat. Peg.....℔ gr. 35¢@38¢
Awls, Shouldered Brad..℔ gr. $1.30@ 1.40
Awls, Handled Brad....℔ gr. $2.60@$3.00
Awls, Handled Scratch..℔ gr. $4.00@4.50
Awls, Socket Scratch..℔ doz. $1.10@$1.20

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00	$7.50
First qual., other brands	6.50 / 6.75	7.00
Second quality	5.50	6.00

Axle Grease—See *Grease, Axle.*

Axles—
No. 1....3½¢@4½¢, No. 2, 5¢@6¢
Nos. 7 to 14.....60&10%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
} 3% cash
Concord Axles, loose collar.....4½¢@6¢
Concord Axles, solid collar.....5½¢@7¢
Watrous Tubular Self Oiling..... 33⅓%@33⅓&5%

Bag Holders—See *Holders, Bag.*

Balances—
Spring Balances.....40%
Chatillon, ℔ doz.....$0.80 0.95 1.75 net
Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See *Wire, Barb.*

Bars—
Crow—
Cast Steel.....℔ ℔ 3½¢
Iron, Steel Points.....℔ ℔ 3¢

Basins, Wash—
Standard Fiberware, No. 1, 10½-in., $1.80; 12-inch, $2.00; 13½-inch, $2.50; 15-inch, $3.00.

Beams, Scale—
Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—
Egg—
Dover.....℔ doz $1.00@$1.20
Duplex (Standard Co.).....℔ doz $1.00
Dover (Standard Co.).....℔ doz $1.00
Duplex Extra Heavy (Standard Co.)..... ℔ doz. $3.50
Bryant's.....℔ gross $14.00
Double (H. & R. Mfg. Co.), ℔ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....℔ gro $12.00
Triple (H. & R. Mfg. Co.).....℔ gro $16.50
Spiral.....℔ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.).... ℔ gro. $9.00
Silver & Co.....℔ doz $5.50

Culinary—
Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

Bells—
Cow—
Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky.....70@70&10%
Texas Star.....50&10@50&10&5%

Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%

Electric—
Wollensak's.....20%
Bigelow & Dowse.....20%

Hand—
Light Brass.....70&10@70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous—
Call.....45@50%
Farm Bells.....℔ ℔ 3¢&3½¢
Steel Alloy Church and School Bells..40%

Bellows—
Blacksmiths'.....60&10&5@60&10&10%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—
Common Standard.....75@75&10%
Standard.....70&5@70&10%
Extra.....60&10@60&10&10%
N.Y.B.&P. Co., Carbon.....60@60&5%
N.Y.B.&P.Co., Diamond..... 50@50&5%
N.Y.B.&P.Co., Para.....40@40&5%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—
Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—
Cleveland Block Co., Mal. Iron.60@60&10%
Moore's Novelty, Mal. Iron.....60%
Sure Grip Steel Tackle Blocks.....25%
See also *Machines, Hoisting.*

Bolts—
Carriage, Machine, &c.—
Com. list June 10, '84.....75&10&5@80%
Genuine Eagle, Norway, list Oct. '84..... 80&5@80&10%
Eagle, Norway, list Oct. '84 80&10@80&15
Phila. pattern, list Oct. 7, '84..... 80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—
Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wrought Square.....70&10@75%
Wr't Shutter, all Iron, Stanley's..... 60&10@60&10&10%
Wr't Shutter, Brass Knob.....50@50&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%
Wr't B. K. Flush, Common.....55&10%

Stove and Plow—
Stove.....60&10@60&10&5%
Plow.....60&10&50@60&10&10%
R. B. & W., Plow..... 55%

Tire—
Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16 '84.....80%
Philadel., list Oct. 16, '84 .....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84...80%

Borers, Tap—
Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20%
Clark's.....33⅓@35%

Borax—
Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—
Per ℔.....2¾¢

Boxes, Miter.
Spliker's Excelsior, 3 in. $7.50, 4 in $8 50, 5 in. $13.00, 6 in. $15.00.....20%

Braces—
American Bit Brace and Tool Co..
Nos. 10, 12, 20..... ....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber s.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew s,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's...50&5@50&10%
Fray's Nos. 70 to 120, 31 to 123. 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—
Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See *Wire.*

Broilers—
Henis' Self-Basting. { Inch..... 9 10 9x11
Per doz...$4.50 5.50 6.50
New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....℔ doz. $12, 50%
Queen City.....33⅓%

Buckets, Well—
Galvanized—
Hill's.....℔ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....℔ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....℔ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers, Butcher's.*

Brass—
Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....50%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—
Fast Joint, Narrow.....50&10&5@50
Fast Joint, Broad.....50&10@50%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} 75@75 &10%

Wrought Steel—
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Indide Blind, Light.....
Loose Pin.....
} List Jan. 2 1893, 40@40&10%
Bronzed Wrought Butts.....50@50&10%

Calipers—See *Compasses.*

Calks, Toe—
Gautier, One Prong, Blunt.....5½@6¢
Burke's One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See *Openers, Can.*

Cans, Milk—
S. S. & Co.: 5-gal., $3.00; 8-gal., $4.40; 10-gal., $4.75 each.....40&10%

Cans, Oil—
Galvanized Blue Band, 5 gal., Tip-Top, ℔ doz, $12.00
Galvanized Blue Band, 5 gal, Faucet, ℔ doz., $8.00.
Galvanized Blue Band, 1 gal., ℔ doz. $2.25
Glass Oil, Friend.....℔ doz. $2.75

Caps—
Percussion—
Hicks & Goldmark's and Union Metallic Cartridge Co. ℔ 100
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47@50¢
Musket. Waterproof, 1-10's.....50@55¢
G. D.....27@30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56@55¢
Eley's D Waterproof, Central Fire..$1.60

Primers—
Berdan Primers, $1.00.....75
B. L. Caps (Sturtevant Shells) $1.00....55
All other Primers, $1.20.....95

Cards—
Watson's Cotton, Wool, Horse and File, list January 28, 1891.....25%

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—
Rim Fire Cartridges.....50&5&25
Rim Fire Military.....15&2½
Cent. Fire, Pistol and Rifle.....25&5&25
Cent. Fire, Military and Sporting 15&5&25
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....25
Blank Cartridges, 32 cal., $3.50.....25
Primed Shells and Bullets.....15&5&25
B. B. Caps, Round Ball, $1.75.....25
B. B. Caps, Con. Ball, Swgd., $2.00.....25

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—
Bed.....
Plate.....
Shallow Socket...
} Brass.....55@55&10%
} Others....60@60&10%
Deep Socket.....40&10%
Martin's Patent (Phœnix).45&10@50&10%
Tucker's Patent, low list.....45%
Payson's Anti-friction.....70@70&10%
Payson's Truck.....60@60&10%
Yale Casters, low list.....45%
Yale, Gem.....70%
Giant Truck Casters.....35%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50@50&10%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%

Cattle Leaders—See *Leaders, Cattle.*

Cement—
Victor Elastic.....5 ℔ pails ℔ ℔ 5¢

Chain—
Trace, Wagon and Fancy Chains, List revised May, 1893.....60@60&10%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.30	4.45	3.80	3.65	3.50	3.40	3.30

Less than cask lots, add½¢@1¢ ℔ ℔.
German Coil, list July 12, 189260@60&10%
German Halter Chain, list July 12, 1892. 60@60&10%
Covert Halter.....60&25
Covert Traces.....35&25
Covert Heel Chain.....50&25
Galvanized Pump Chain.
5 ton lots.....℔ 100 ℔ $5.50
1-ton lots.....℔ 100 ℔ $5.75
500-℔ lots.....℔ 100 ℔ $6.75
Less than 500 ℔.....℔ 100 ℔ $7.00
Oneida Halter Chain.....60@60&5%
Jack Chain, Iron and Brass, list July 10, 1893.....60%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....65%

Chalk—
White, case lots. ℔ gr 50¢; small lots.65¢
Red, case lots....℔ gr 67¢ small lots.75¢
Blue, case lots....℔ gr 75¢; small lots 80¢
See also Crayons

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Chalk Lines—See *Lines.*

Checks, Door—
Unity 50%

Chisels—

Socket Framing and Firmer
P. S. & W ..... 75&10@75&10&10%
New Haven .....
Witherby, ...
Mix .....
Ohio Tool Co. .....
Douglass ..... 75@75&5%
Buck Bros 30%
Merrill ..... 60&10@60&10&5%
L. & I. J. White ..... 30@30&5%

Tanged and Miscellaneous.
Tanged Firmers ..... 50@50&10%
Butchers' ..... $4.75@$5.00
Spear & Jackson's ..... $5 to 2
Buck Bros 30%
Cold Chisels, ℔ ℔ ..... 15@16¢

Chucks—
Beach Pat. ..... each, $8.00 ..... 20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury ..... each, $6.00, 30@30&5%
Syracuse, Balz Pat. 25%
Graham Patent 33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks 33⅓%
Universal Lathe Chucks 40%
Independent Lathe Chucks 40%
Drill Chucks 15%
Union Mfg. Co.
Victor $8.50, 25%
Combination 40%
Universal 40%
Independent 40%

Churns—
Tiffin Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—
R. I. Tool Co.'s Wrought Iron 25%
Adjustable, Cincinnati ..... 15&10%
Adjustable, Hammers ..... 15@15&5%
Adjustable, Stearn's ..... 30@30&10%
Stearn's Adjustable Cabinet and Corner ..... 30@30&10%
Cabinet, Sargent's ..... 70&10%
Carriage Makers', Sargent's ... 75@75&5%
Carriage Makers', P., S. & W Co... 40&10%
Eberhard Mfg. Co. ..... 40&5@40&10%
Warner's ..... 40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenter's, Cincinnati ..... 25&10%
Barnes' Machinists' Clamps. 33⅓%

Cleavers, Butchers'—
Bradley s ..... 25@30%
L. & I. J. White ..... 20&5%
Beatty's ..... 40@40&5%
New Haven Edge Tool Co.'s 40%
P., S. & W ..... 33⅓&5@33⅓&10%
Foster Bros 30%
Schulte, Lohoff & Co ..... 40@40&5%

Clips—
Norway, Axle, ¼ & 5-16 ..... 55&5&5%
2d grade Norway Axle, ¼ & 5-16... 65&5%
Superior Axle Clips ..... 66⅔&5@70%
Norway Spring Bar Clips, 5-16... 60&5&5%
Wrought Iron Felloe Clips ..... ℔ ℔, 5½¢
Steel Felloe Clips ..... ℔ ℔, 5¢
Baker Axle Clips 25%

Cloth and Netting, Wire
—See *Wire, &c.*

Cockeyes 50%

Cocks Brass—
Hardware list ..... 60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—
Chapman Mfg. Company, new list.... 40%
Medford Fancy Goods Co..... 40&10@50%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list 40%
Brass, Pope & Steven's list 40%

Combs, Curry—
Fitch's ..... 50&10@50&10&10%
Rubber, per doz., $10.00 ..... 25%
American Curry Comb Co. ..... 33⅓@40%
Kohler's Magic Oscillating... ℔ doz., $2.00
Kohler's Humane ..... ℔ doz., $1.75

Compasses, Dividers, &c.
Compasses, Calipers, Dividers. 70@70&10%
Bemis & Call Co.'s
Dividers 65%
Compasses ..... 50&5%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Calipers, Double 65%
Calipers, Call's Patent Inside 55%
Excelsior 50%
Stevens & Co.'s ..... 25&10%
Starrett's
Spring Calipers and Dividers.... 25&10%
Lock Calipers and Dividers 25%
Combination Dividers 25%

Coolers, Water—
S. S. & Co.: 2-gal., $2.00; 3-gal., $2.50; 4-gal., $2.75; 6-gal., $3.40 each.... 33⅓%

Coopers' Tools—
See *Tools, Coopers'.*

Cord—

Sash—
Common ..... ℔ ℔, 8½@9¢
Patent, good quality ..... ℔ ℔, 10@11¢
White Cotton Braided, fair... ℔ ℔, 23@24¢
Common Russia Sash ..... ℔ ℔, 12½@13¢
Patent Russia Sash ..... ℔ ℔, 13½@ 14¢
Cable Laid Italian Sash ..... ℔ ℔, 19@20¢
India Cable Laid Sash ..... ℔ ℔, 11½@12¢
Silver Lake—
A quality, White, 50¢ 25%
A quality, Drab, 55¢ 25%
B quality, White, 30¢ 10%
B quality, Drab, 35¢ 10%
Sylvan Spring, Extra Braided, White. 34¢
Sylvan Spring, Extra Braided, Drab.. 39¢
Semper Idem, Braided, White.... 27@28¢
Egyptian, India Hemp, Braided ..... 26¢
Massachusetts, White ..... 29¢
Samson—
Braided, White Cotton ..... ℔ ℔, 37¢
Braided, Drab Cotton ..... ℔ ℔, 42¢
Braided, Italian Hemp ..... ℔ ℔, 40¢
Braided, Linen ..... ℔ ℔, 56¢
Tate's Solid Braided—
Hercules, White ..... ℔ ℔, 25¢
Hercules, Drab ..... ℔ ℔, 30¢
Economy Drab ..... ℔ ℔, 27¢
Economy White ..... ℔ ℔ 22¢
Ussawan Mills—
Braided, Giant, Whit ℔ ℔, 30¢.... 20%
Braided Giant, Drab and Fancy, ℔ ℔ 35¢ 10%
Braided, Crown White, ℔ ℔, 50¢... 50%
Braided, Crown Drab and Fancy, ℔ ℔ 5¢ 30%

Wire Picture—
Braided or Twisted ..... 80&5@80&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters
—See *Knives, Corn.*

Crackers Nut—
Table (H. & B. Mfg. Co) 40%
Blake's Pattern, ℔ doz., $2.00 ..... 10%
Turner & Seymour Mfg. Co 50%
Acme.
Japanned, ℔ gro., $30 ..... 50%
Nickel Plated, ℔ gro. $30 ..... 10%

Cradles—
Grain ..... 50&2@50&5&2%

Crayons—
White Crayons, ℔ gross ..... 7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers', ℔ gross, $1.75 ..... 25%
Rolling Mill, ℔ gross, 2.50 ..... 25%
Railroad, ℔ gross, 2.00 ..... 25%
Soapstone Pencils, ℔ gross, 1.00 ..... 25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crow Bars—See *Bars, Crow.*

Curry Combs—
See *Combs, Curry.*

Curtain Pins—
See *Pins, Curtain.*

Cutters—

Meat—
Dixon's, ℔ doz. ..... 40@40&5%
Nos. 1 2 3 4
$14.00 $17.00 $19.00 $30.00
Woodruff's, ℔ doz. ..... 40@40&5%
Nos. 100 150
$15.00 $18.00
Hale's, ℔ doz. 70%
Nos. 11 12 13
$27.00 $33.00 $45.00
American 30%
Nos. 1 2 3 4 B 5
Each $5 $7 $10 $25 $50 $60
Enterprise 25%
Nos. 10 12 22 32 42
Each $3 $2.50 $4 $6 $15
Little Giant, ℔ doz. ..... 40&10@50%
Nos. 305 310 312 320 322
$35.00 $48.00 $44.00 $72.00 $68.00
Triumph No. 505, ℔ doz., $21.00.. 25@30%
Miles' Challenge, ℔ doz. ..... 45@45&10%
Nos. 1 2 3
$22.00 $30.00 $40.00
Home No. 1, ℔ doz., $26.00 ..... 55&10%
Draw Cut, each:
Nos. 5 2 6 8
$50 $75 $80 $225 ..... 20@25%
Beef Shavers (Enterprise) 20%
Chadborn's Smoked Beef Cutter, ℔ doz., $66.00

Slaw and Kraut—
Tucker & Dorsey Mfg. Co.:
Slaw Cutters, 1 Knife, ℔ gross... $21.00
Slaw Cutters, 2 Knife, ℔ gross... 30.00
Kraut Cutters 40%

Tobacco
Champion ..... 20&10@30%
All Iron ..... ℔ doz., $4.25
Nashua Lock Co.'s. ℔ doz., $18.00, 50@55%
Wilson's 55%
Sargent's ..... ℔ doz., $24.00, 55&10
Acme ..... ℔ doz., $20.00, 40%

Washer—
Smith's Pat.... ℔ doz., $12.00, 20&10&10%
Johnson's ..... ℔ doz., $11.00, 33⅓%
Penny's.. ℔ doz.,, Pol. $14; Jap'd, $16, 55%
Appleton's ..... ℔ doz., $16.00, 60&10%
Bonney's ..... 30&10%
Cincinnati ..... 25&10%

Diggers, Post Hole, &c.—
Samson, ℔ doz., $34.00 ..... 25@25&10%
Fletcher Post Hole Augers, ℔ doz., $36.00, 20@20&10%
Eureka Diggers ..... ℔ doz. $12.00@$13.00
Vaughan's Post Hole Auger, ℔ doz., $8.50@$9.50
Kohler's Little Giant ..... ℔ doz., $18.00
Kohler's Hercules ..... ℔ doz., $14.00
Kohler's Invincible ..... ℔ doz., $12.00
Kohler's New Champion.... ℔ doz., $8.00
Scheidler ..... ℔ doz., $18.00
Cronk's Post Bars, ℔ doz., $60.00, 50&5@50&10%
Gibb's Post Hole Digger..... ℔ doz., $15.00
Gibbs' National ..... ℔ doz., $12.00
Gibbs' Columbia ..... ℔ doz., $13.00
Gibbs' Imperial ..... ℔ doz., $7.50
Shimer's Hollow Handle.. ℔ doz., $24.00, 50%
Gem, Improved ℔ doz.,, $9.00@$10.00 net

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers.
Money, ℔ doz ..... $18@$20
Waddel's Improved, ℔ doz $15.00

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Blacksmiths' ..... each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Breast, P. S. & W ..... 40&10%
Breast, Wilson's ..... 30&5%
Breast, Millers Falls ..... each $3.00, 25%
Breast, Bartholomew's ..... each $2.50 25&10@40%
Ratchet, Merrill's ..... 20@20&5%
Ratchet, Ingersoll's 25%
Ratchet, Parker's ..... 20@20&5%
Ratchet, Whitney's ..... 20&10%
Ratchet, Weston's ..... 20@25%
Ratchet, Moore's Triple Action.... 25@30%
Ratchet, Curtis & Curtis 30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00 ..... 20&10%
Automatic Boring Tools ..... $1.75@$1.85
Chicopee Automatic Drill ..... 20&10%
Goodell Automatic Drills ..... 40&5%

Twist Drills—
Cleveland ..... 50&10&10%
Diamond, W. & B. ..... 50&10&10%
Graham's Pat. Groove Shank. 50&10&10%
Morse ..... 50&10&10%
New Process ..... 50&10&10%
Standard ..... 60&10&10%
Syracuse (Metal list) ..... 50&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Douglass Mfg. Co ..... 20@20&10%
Disston's 50%
Buck Bros 30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles ..... 65&10%
No. 86 ..... 70&10%
Sargent & Co.'s
No. 1, Forged Blade ..... 60&10&10%
Nos. 20, 40 and 60 ..... 66⅔&10&10%
P. S. & W 70%
Knapp & Cowles
No. 1 ..... 60&20@70%
No. 2 ..... 60&10&10@70&5%
No. 3 ..... 60&5@60&10%
Nos. 4 and 00, Acme and Ideal.. 50&5@50&10&5%
Stearns' ..... 25&10&5%
Gay & Parsons 35%
Champion ..... 25&10%
Clark's Pat ..... 30@33⅓%
Ellrich's Socket and Ratchet.. 25@25&10%
Allard's Spiral, new list 25%
Kolb's Common Sense.. ℔ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits..... 30&30&5%
Screw Driver Bits ..... ℔ doz., 50@75¢
Screw Driver Bitts, Parr's.. ℔ gross, $6.25
Fray's Hol. H'dle Sets... No. 3, $12.00, 45%
Cincinnati ..... 25&10%
Brace Screw Drivers ..... 25&10%
Buck Bros.' Screw Driver Bits.... 27½&5%
Goodell's Automatic 50%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 45&10%
C. T. Williamson Wire Novelty Co..... 50%

Egg Beaters—See *Beaters, Egg*

Egg Poachers—
See *Poachers, Egg.*

Electric Bell Sets—
See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF.

	46 gr.	150 gr.	F.FF.
Kegs, ℔ ℔	4½¢	5 ¢	2½¢
½ kegs, ℔ ℔...	4¾¢	5½¢	2¾¢
¼ kegs, ℔ ℔...	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow*

Escutcheon Pins—
See *Pins, Escutcheon.*

Escutcheons—
Door Lock.... Same dis. as Door Locks.
Brass Thread ..... 60@60&10%
Wood 25%

Expanded Metal—
List No. 5.
Lathing 10%
Fencing, Painted Sheets 20%
Netting, Painted Sheets 20%
Door Mats, Galvanized 25%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Mackrell's, ℔ doz., $1.00 ..... 20@20&10%
Van Sand's Screw Pat, $15 ℔ gr.. 60&10%
Van Sand's Old Pat., $15 ℔ gr ..... 55&10%
Austin & Eddy No. 2008 ..... ℔ gr., $9.00
Security Gravity ..... ℔ gr., $9.00
Zimmerman's ..... 50&10%

Faucets—
Fenn's 40%
Fenn's Cork Stops 33⅓%
Star 60%
Frary's Pat. Petroleum 60%
B. & L. B. Co.
West's Lock, Open and Shut Key... 50%
Star, Metal Plug, new list 40%
Lockport, Metal Plug, reduced list.. 60%
Metallic Key, Leather Lined.... 60&10@60&10%
Cork Lined ..... 70&5@70&10%
Burnside's Red Cedar 50%
Burnside's Red Cedar, bbl. lots... 50&10%
John Sommers'
Peerless Best Block Tin Key 40%
IXL, 1st quality, Cork Lined 50%
Diamond Lock 40%
Perfection, Fla. Red Cedar (in boxes) 40%
Boss Metallic Key 50%
Reliable Cork Lined 60%
O. K. Western Pattern Cork Lined.. 50%
No Brand, Red Cedar (in bbls.).. 50&10%
Western Pattern Metal Key 40%
No Brand Metal Key 60%
Self Measuring
Enterprise, ℔ doz., $36.00 ..... 20%
Lane's ℔ doz., $36.00 ..... 25&10%

Felloe Plates—
See *Plates, Felloe.*

Fibre Ware—See *Ware, Fibre.*

Fifth Wheels—
Derby and Cincinnati ..... 45&5%
Brewster ..... 50&5%

Files—

Domestic—
Nicholson Files, Rasps, &c. 60&10&5@60&10&10%
Nicholson (X.F.) Files 25%
Nicholson's Royal Files (Seconds).... 75% (extra prices on certain sizes.)
American ..... 66⅔&10@66⅔&10&5%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Arcade ..... 60&10&10@70%
Eagle ..... 60&10&10@70%
Other makers, best brands.. 60&10&5@70%
Fair brands ..... 70&10@70&10&10%
Second quality ..... 80@80&5%
Heller's Horse Rasps..... 50&7½@50&10%
McCaffrey's Horse Rasps ..... 50&10%
Chelsea Horse Rasps, Hand Cut... 50&10%
Arcade Horse Rasps.... 60&10@60&10&5%
Trojan Horse Rasps ..... 60&10&5%

Imported—
Butcher ..... Butcher's list, 25%
Stubs ..... Stubs' list 25@30%

Fixtures. Grindstone—
Sargent's Patent ..... 70&10%
Reading Hardware Co ..... 60&10%
P., S. & W. Co ..... 60&10%
Moore's 55%

Fluting Machines—
See *Machines, Fluting.*

Fluting Scissors—
See *Scissors, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Hay, Manure, &c. Asso. List. 70@70&5&2%
Hay, Manure, &c., Phila. List, 60@60&10&2%
Plated, see Spoons.

Frames—

Saw—
White Vermont ..... ℔ gro., $9.00@$10.00
Red, Polished and Varnished.... ℔ doz., $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons... 33⅓@33⅓&10%
Stearns' Frames and Corners. 25@25&10%
Cortland ..... 40@40&5
Phillips' Window Screen Frames..... 50@50&5%
Bonanza Window Screens.. 50&5@50&10%
Empire Fancy Screen Doors, ℔ doz .. $12

Freezers Ice Cream—
White Mountain ..... 60@60&5%
Granite State ..... 65@65&5%
Arctic ..... 70@70&5%
American 60%
Buffalo Champion ..... 65@65&5%
Shepard's Lightning ..... 65@65&5%
Gem 65%
Blizzard 70%
Double Action Crown 60%
Crown 60%
Star 60%
Peerless ..... 60&10%
Giant 60%
Zero 70%
Boss and Pet ..... 60&10&10&10%
Keystone, P., D. & Co., each, $1.50.... 20%
Standard ..... 60@60&5%
Standard Double Action ..... 60@60&5%
Good Luck ..... 65@65&5%
Model ..... 60@60&5%
Confectioners' Machine 50%

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fruit Pickers—
See *Pickers, Fruit.*

Fry Pans—See *Pans, Fry.*

Funnels—
Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro 30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz 25%

Furnaces, Soldering—
Burgess No. 3 Gem tin reservoir.... $7.00
Burgess No. 3 Gem, Copper reservoir. $8.50
Clayton & Lambert No. 1 Fire-Pot, complete $6.00

Fuse—Dis. 12½@15%. ℔ 1000 ft.
Common Hemp Fuse, for dry ground. $2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.80
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water. 12.00

Gates Molasses—
Stebbin's Pattern ..... 80@80&5%
Stebbin's Genuine ..... 60&10&10%
Stebbin's Tinned Ends ..... 40&10%
Lincoln's Pattern ..... 70@70&10%
Weed's ..... 20&10%
Boss, ℔ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10 ..... 60&10&10%

Gauges—
Marking, Mortise, &c ..... 60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge ..... 20&10%
Barrett's Comb. Roller Gauge ..... ℔ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale ..... ℔ doz., $5.00
Without Scale ..... ℔ doz., $4.00
Wire, Wheeler, Madden & Co 10%
Wire, Morse's 25%
Wire, Brown & Sharpe's ..... 10@20%
Wire, P., S. & W. Co ..... 10&10%

Gimlets—
Nail and Spike ..... 50&10&5%
Eureka Gimlets ..... 60&10%
Diamond Gimlets ..... ℔ gr $5.00
Double Cut, Shepardson's ..... 45@45&5%
Doub e Cut, Ives' ..... 60@60&5%
Double Cut, Douglass' ..... 40&10%

Glue—
Le Page's Liquid ..... 25@25&5%
Upton's Liquid 35%
Improved Process ..... 25@25&5%
Dodd's Liquid Glue ..... 25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Fraser's ..... Keg ℔ ℔ 4¢, Pail ℔ ℔ 5¢
Fraser's, in boxes ..... ℔ gr $9.50
Dixon's Everlasting, in bxs.. ℔ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting.... 10-℔ pails, ea. 85¢
Lower grades, special brands, ℔ gr $5.50@$7.00
Axleine, tin boxes ..... ℔ gross $12.00
English Coach, wooden boxes ..... ℔ gross $3.50
English Coach, 5-℔ tin pails. ℔ doz. $3.50
Tiger, wooden boxes ..... ℔ gross $7.00
Tiger, 5-℔ tin pails ..... ℔ doz $3.50

Grindstones—
Family, regular list 60%
Family, Cleveland Stone Co 30%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
Sewing, Brass Fer. ℔ gr $1.75
Pat. Sewing, Short. ℔ doz ..... 45@50%
Pat. Sewing, Long ..... ℔ doz $1.30
Pat. Peg, Plain Top. ℔ doz ..... 40@45%
Pat Peg, Leather Top. ℔ doz 60

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ½-in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓%
Covert's Saddlery Works Horse and Cattle Ties 33⅓%
Covert's Saddlery Works Handy Web Halters.....33⅓%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....
Verree.....} ....50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting...50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40%
Sargent's.....40@40&10%

Heavy Hammers and Sledges—

8 ℔ and under...℔ 40¢ } 75&10@75&10 &5%
8 to 5 ℔.....℔ 36¢ }
Over 5 ℔.....℔ 30¢ }
Wilkinson's Smiths.....10½¢@11¢℔

Handcuffs and Leg Irons —See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins', new list 40%
Champion.....15%
Ely's Perfection.....℔ doz., $3.00
Sensible.....40%

Iron, Wrought or Cast—

Door or Thumb.

Nos.....	0	1	2	3	4
Per doz....	$0.90	1.00	1.08	1.35	1.50

60&10&10%
Roggin's Latches.....℔ doz 30¢@35¢
Bronze Iron Drop Latches..℔ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ℔ doz $1.40.....10&10%
Chest and Lifting.....70@70&10%

Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....℔ gr $2.00
Hickory Firmer Chisel, ass'd. ℔ gr 4.50 }
Hickory Firmer Chisel, large. ℔ gr 5.00 }
Apple Firmer Chisel, ass'd...℔ gr 5.00 } @
Apple Firmer Chisel, large...℔ gr 6.00 } 40&10@50%
Socket Firmer Chisel, ass'd..℔ gr 3.00 }
Socket Framing Chisel, ass'd. ℔ gr 5.00 }
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....℔ gr 2.75 }
Auger, assorted.....℔ gr 5.00 } 50%
Auger, large.....℔ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....℔ set $1.25
Pat. Auger, Swan's.....℔ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10@60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti-Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10@50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield .....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....30@30&10%
Lane's New Standard.....50@50&5%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Stearns' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati Nos. 1, $2.25; 3, $2.50; 4, $2.50.
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $35; 1, $20; 2, $15. 40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Moody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%
Lundy, Steel Parlor.....40%
Matchless.....50&10%
Magic.....45&10%
Wild West.....45&10%
Moore's Elevator.....33⅓%
Moore's Baggage Car Door 33⅓%
Moore's Railroad.....55%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....} 40 & 10 @ 50&5%
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
Collins.....10%
Schulte, Lohoff & Co.....50@5&5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 12, 13.75@75&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....℔ doz $4.20, 60@60&10%
N. E.....℔ doz $7.80, 60@60&10%
N. E. Reversible ℔ doz..$5.60, 6 @60&10%
Clark's, Nos. 1 2, 3.....60&10&5%
N. Y. State.....℔ doz $4.90,60@60&10%
Automatic.....℔ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking 15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....66⅔%
Reliable.....60%
Champion.....60%
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ℔ gro., $30.....50&5%
Samson.....60@60&7½%
Wiles', No. 1, ℔ gro., $16; No. 2.....$13
Devore, No. 1.....℔ gro , $13.00
Rex.....℔ gro., $13.00
Freeport.....℔ gro., $12.00
New Idea Nos. 1 and 10....℔ gross $13.00
New Idea Dbl. Acting.....45%
Ideal No. 3.....℔ gross $10.00
Stearns' Noiseless Floor Hinge, ℔ set, $5.00.....20&10@30%

Extra 5@10% often given.

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&5%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap..... { 6 to 12 in., ℔ lb.. 4¢ / 14 to 20 in., ℔ lb..3½¢ / 22 to 36 in., ℔ lb.. 3¢
Screw Hook and Eye.... { ⅝ in., ℔ lb 7½¢ / ½ in., ℔ lb 5½¢ / ⅜ in., ℔ lb 4½¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 252 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges "Providence" { 8, 10 & 12 in., ℔ lb.....5¢ / over 12 in. ℔ lb.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat } 60&5
Am. Axe and Tool Co., S. & O. Pat. } @60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....℔ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....℔ doz $18....60%

Bit—

Extension.
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

File and Tool—

Bals Pat.....℔ doz $4.00, 25%
Nicholson File Holders.....20%

Sash—

Motley's Adj. Sash, Medium Size.....
℔ doz $1.20, 40%

Hooks—

Cast Iron—

Bird Cage, Sargent's List.....
Bird Cage, Reading.....} 60&10&10%
Clothes Line, Sargent's list }
Clothes Line Moore's.....70%
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading. 50&10@50&10&10%
Coat and Hat, Moore's.....70%

Wrought Iron—

Cotton.....℔ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle W'ks.....80%
Tassel and Picture, T. & S. Mfg.Co....50%
Wrought Staples Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt .....80&15@80&20%
Atlas, Coat and Hat.....65%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass, No.2, $2.00; No.3, $2.10; No. 4, $2.25
Nolin's Grass.....℔ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition. Fair quality.....75@75&10%
Competition, Low Grade .....80@80&10
Standard.....70&10&70@10&5%
Extra.....60&10@60&10&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40&5@50%
N. Y. B. & P. Co., Dundee.....60@60&5%
Cotton Garden, ¾ in., coupled:
Fair Quality, ℔ lb .....7¢
Good Quality, ℔ lb.....8½¢

Huskers—

Blair's Adjustable.....℔ gr $8.00
Blair's Adjustable Clipper.....℔ gr 7.00
Hubbard's Solid Steel.....℔ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....℔ 100 lb, $2.30@$2.40
Self-Heating.....℔ doz $8.00
Self-Heating Tailors'.....℔ doz $18.00
Mrs. Potts' Sad Irons, per set:

No.	50	55	60	65
Small lots.....	.90	.85	1.05	.95

Crown.....60&10@60&10&5%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ℔ lb.....3@3½¢
Chinese Laundry (N.E.Butt Co.).8½¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓%
National Self-Heating.....30%

Soldering—

Soldering Coppers .....℔ lb 19@21¢
Covert's Adjustable, list Jan. 1, 1886, 35&2%
Tinker's Dread..℔ doz $1.75; ℔ gro. $18

Pinking—

Pinking Irons, ℔ doz., 55@60¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓%
Victor.....33⅓%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....℔ lb 21¢
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AA A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Bradley's.....10%
Wadsworth's.....25@25&10%

Drawing—

Witherby.....
P., S. & W.....
Mix.....
New Haven.....} ...75@75&10&5%
Merrill.....60&10@60&10&5%
Douglass.....75&75@5%
Watrous.....15&10@5%
L & I. J. White.....20&5%
Bradley's.....25%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$8.00@$9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle...℔ doz. $11.00@$11.50
Heath's.....℔ doz. $13.00@$13.50
Nolin's Hay.....℔ doz. $7.00@$8.00

Mincing—

Am. (2d quality), ℔ gr., 1 blade, $7
2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ℔ doz., Single, $2; Double $3 45@50%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable....℔ doz. $3.00, 33⅓%

Knobs—

Door, Mineral .....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nicke..l....$2.00@$2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....℔ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...15%

Ladders.

Davies Extension and Single.....20&5%

Ladles—

Melting, Sargents'.....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Regular, with Guard.....℔ doz $3.50
O. K., with Guard.....℔ doz $3.75
Side Lift, with Guard.....℔ doz $4.00
Square Lift, with Guard.....℔ doz $4.25
Anti-Friction, with Guard....℔ doz $4.50
Brass Plated, Sq. Lift, Guard.℔ doz $5.50
Cop. Plated, Sq. Lift, Guard..℔ doz $5.50

Bull's Eye Police—

2¾-inch regular.....℔ doz $3.60
3-inch regular.....℔ doz $3.90
2¾-inch flash light.....℔ doz $4.00
3-inch flash light.....℔ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's.....70&10@70&10&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....50%
Skylight Lifters.....35%
Reiher's, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk 55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 1lb
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes..Nos. 18 19 20
100 ft..... $3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50..20%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.....	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev. Jan. 1, '85.33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 87 to 96.....30%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&10
Champion Cab. and Combin.....33⅓%
Yale.....net prices
Romer's.....25

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar.20, 1889..... } 65&10@70% Much
Mallory, Wheeler & Co., list July, '88..... } lower net prices
Sargent & Co., List Aug.1, '88 } often
Branford Lock Works } made

Brittan, Graham & Mathes, list Jan. 1890 ... 60&10&10%
Plate ... 33⅓&2%
Barnes Mfg. Co. ... 40@40&10%
Yale ... net prices
Deitz Flat Key ... 30%
Romer's Night Latches ... 15%
Brooklyn Latches ... 50&10%
Warner's Burglar Proof. ℔ doz. $8.00, 50%

Elevator—

Moore's ... 33⅓%

Padlocks—

List June 10, 1891 ... 50&2%
Norwich Lock Mfg. Co., old list ... 50&2%
Yale Lock Mfg. Co.'s ... net prices
Eagle ... 40%
Eureka, Eagle Lock Co. ... 40&2%
Romer's Nos. 0 to 91 ... 30%
Romer's Scandinavian, &c., Nos. 100 to 505 ... 15%
A. E. Deitz ... 40%
Champion Padlocks ... 40%
Hotchkiss ... 30%
Star ... 60%
Horseshoe ... ℔ doz $9, 50@50&10%
Barnes Mfg. Co. ... 40@40&10%
Nock's ... 30%
Scandinavian ... 90&40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140 ... 90&10%
Other Nos. ... 65%
Ames Sword Co. up to No. 150 ... 40%
Ames Sword Co. above No. 150 ... 50%
Slaymaker, Barry & Co.
No. 1010 line ... 90&5%
No. 41 line ... 50%
No. 61 line ... 60%
No. 21 line ... 80%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ℔ gr. ... 33⅓%
Ferguson's ... 33⅓%
Victor ... 60&10&2%
Walker's ... 10%
Attwell Mfg. Co. ... 25&33⅓%
Reading ... 66⅔&10@66⅔&10&10%
Hammond's Window Springs ... 40%
Common Sense, Jap'd, Cop'd and Br'zed ... ℔ gr $4.00
Common Sense, Nickel Plated. ℔ gr $10.00
Universal ... 30%
Kempshall's Gravity ... 60%
Kempshall's Model ... 60@60&10%
Corbin's Daisy, list Feb. 15, 1886 ... 70%
Payson's Perfect ... 60&10&10%
Hugunin's Sash Balances ... 25&5&2%
Hugunin's New Sash Locks ... 25&5&2%
Ives Patent ... 60&10&5@60&10&10%
Fish (Liesche's pat.), No. 100, ℔ gr., $8; No. 105, ℔ gr., $10 ... 50%
Davis, Bronze, Barnes Mfg. Co. ... 60%
Champion Safety list January, 1893. 70&5%
Security ... 70%
Giant, list Jan., 1892 ... 70&5%
Wolcott's ... 60&10&5%
Monarch ... 50%

Lumber Tools—

See *Tools, Lumber.*

Lustro—

Four-ounce bottles ... ℔ doz, $1.75; ℔ gross ... $17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75		50%
Snell's, Rice's Pat.	5.50	6.75	40&10&10%	
Jennings'	5.50	6.75	45&10%	
Other Machines	2.35	2.75		
Phillips' Patent with Augur	7.00	7.50		
Miller's Falls	7.50			25%

Boss, Carpenters' 3.60
Boss, Ship Bldrs'. 3.85

Fluting—

Knox, 4½-inch Rolls ... $3.25 each } 35%
Knox, 6-inch Rolls ... $3.60 each }
Eagle, 3½-inch Rolls, $2.15 ... 35%
Eagle, 5½-inch Rolls, $2.85 ... 35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each ... 35%
Crown Jewel, 6 in. ... $3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each ... 35%
Domestic Fluter ... each, $1.50
Geneva Hand Fluter, White Metal, ℔ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25 ... 30%
Shepard Hand Fluter, No. 85, per doz $15.50 ... 40%
Shepard Hand Fluter, No. 110, ℔ doz $11.00 ... 40%
Shepard Hand Fluter No. 95, ℔ doz $8.00 ... 40%
Combined Fluter and Sad Iron. ℔ doz $15.00 ... 30%

Hoisting—

Moore's Hand Hoist, with Lock Brake. 20%
Moore's Anti-Friction Differential Pulley Block ... 20%
Moore's Rope Differential Pulley Block ... 60%
Energy Mfg. Co.'s ... 25%
See also *Blocks.*

Washing—

Anthony Wayne, ℔ doz, No. 1, $42; No. 2, $36; No. 3, $42.
Wayne American ... ℔ doz $36.00
Western Star ℔ doz, No. 2, $36; No. 3 $39.
Weisell ... ℔ doz $54.00
Fair and Square ... ℔ doz $42.00

Mallets—

Hickory ... 20&10@20&10&10%
Lignumvitæ ... 20&10@20&10&10%
S. & L. Block Co., Hickory & L. V. 30@30&10

Mattocks—Regular list. 60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck ℔ dozen, $3.50; ½ peck, $3.00

Meat Cutters—

See *Cutters, Meat.*

Menders, Harness—

Per doz. ... $2.00

Milk Cans—See *Cans, Milk.*

Mills—

Coffee—

Box and Side, List Jan. 1, 1888 .. 60@60&5%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893 ... 20%
The Swift, Lane Bros. ... 30%
Waddel's New Box Mills, Ideal Brand, New List ... 60%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16-in., $5.50; 18-in., $6.
Low-Grade Machines: 10-in. $3; 12-in., $3.25 14-in., $3.50 each

Muzzles—

Safety ... ℔ doz, $3.00, 25%

Nails.—

Cut and Wire. See Trade Report.
Wire Nails, Papered. Association list, May 1, '92. 80&10&10&5%
Tack Mfrs.' list ... 70&5@70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

	Nos. 6	7	8	9	10	
American	9½	9½	9½	9½	9½	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&5&2%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢	30&5%
Essex	28¢	26¢	25¢	24¢	23¢	40&10@50%
Lyra	9½	9½	9½	9½	9½	net
Snowden	9½	9½	9½	9½	9½	net
Standard	23¢	21¢	20¢	19¢	18¢	35%
Vulcan	23¢	21¢	20¢	19¢	18¢	25%
Northwest'n	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢	33⅓@33⅓&10%
Maud S.	25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	28¢	26¢	25¢	24¢	23¢	40&5&2%
Champion	25¢	23¢	22¢	£1¢	20¢	10&10&10%
Capewell	19¢	18¢	17¢	16¢	16¢	10&5%
Anchor	23¢	21¢	20¢	19¢	18¢	35%
Western	23¢	21¢	20¢	19¢	18¢	50%
Empire Bronzed					13@14	℔ ℔

Picture—

Brass Head, Sargent's list ... 60@60&10%
Brass Head, Combination list ... 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent ... 40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.80¢	6.50¢ off list
Cold Punched	5.00¢	5.10¢ off list

In packages of 100 ℔, add 1-10¢ ℔ ℔ net; in packages less than 100 ℔, add ⅛¢ ℔ ℔, net.

Oakum—

Best or Government ... ℔ ℔ 6¾@7¼¢
U. S. Navy ... ℔ ℔ 5¾@6¢
Navy ... ℔ ℔ 5¢@5¼¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Zinc and Tin ... 65&10@70&5%
Brass and Copper ... 50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ℔ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list ... 45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass ... 50%
Olmstead's Tin and Zinc ... 60%
Olmstead's Brass and Copper ... 50%
Broughton's Zinc ... 60%
Broughton's Brass ... 50%
Steel, Draper & Williams ... 50%

Openers, Can—

Messenger's Comet ... ℔ doz $3.00, 25%
American ... ℔ gross $2.75@$3.00
Duplex ... ℔ doz 25¢, 15@20%
Lyman's ... ℔ doz $3.75, 20%
No. 4, French ... ℔ doz $2.25, 55@60%
No. 5, Iron Handle ... ℔ gr $6.00, 45@50%
Eureka ... ℔ doz $2.50, 10%
Sardine Scissors ... ℔ doz $2.75@3.00
Star ... ℔ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 60¾@70%
Excelsior, No. 1 $2.50; No. 2, $1.50 ... 40%
World's Best ℔ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00 ... 50&10%
Universal, ℔ doz $3.00 ... 55&5%
Domestic, ℔ doz $2.00 ... 45%
Champion, ℔ doz $2.00 ... 50%
Moore's ... 70%

Packing, Steam—

Rubber—

Standard ... 70@70&10%
Extra ... 60@60&5%
N. Y. B. & P. Co., Standard ... 50%
N. Y. B. & P. Co., Empire ... 60%
N. Y. B. & P. Co., Salamander ... 25%
Jenkins' Standard, ℔ ℔ 80¢ ... 25@25&5%

Miscellaneous—

American Packing ... 10¢@11¢ ℔ ℔
Russia Packing ... 14¢ ℔ ℔
Italian Packing ... 13¢@14¢ ℔ ℔
Cotton Packing ... 15¢@17¢ ℔ ℔
Jute ... 7¢@8¢ ℔ ℔

Pails—

Creamery—

S. S. & Co.: 18-qt., $7.00; 20-qt., $7.25 per doz. ... 5%

Galvanized—

	Quarts 10	12	14
Hill's Light Weight, ℔ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ℔ dz.	3.00	3.25	3.75
Heiwig's	2.50	2.75	3.00
Sidney Shepard & Co.	2.50	2.75	3.00
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt. ... ℔ doz $4.20
Milk, 14 qt. ... ℔ doz $5.40
Stable, 14 qu. ... ℔ doz $6.00
Fire Pails, deep ... ℔ doz $4.80
Fire Pails, round bottom ... ℔ doz $5.40

Standard Fiber Ware—

	Plain.	Decr'd
Water Pails, 12 qt., ℔ doz.	$3.15	$3.75
Dairy Pails, 14 qt., ℔ doz.	3.75	4.25
Fire Pails, No. 1, 12 qt., ℔ doz	3.75	
Fire Pails, No. 2, 14 qt., ℔ doz	4.25	
Sugar Pails	5.50	6.00
Horse Pails	4.50	
Buggy Pails	3.50	
Slop Jars (bal. trap)	7.50	8.50
Chamber Pails, 14 qt.	6.00	7.00

Pans—

Dripping—

Small sizes ... ℔ ℔ 5½¢
Large sizes ... ℔ ℔ 5¢
Silver & Co. (Covered) ... 40%

Fry—

Standard List:

No.	0	1	2	3	4
℔ doz.	$3.00	$3.75	$4.25	4.75	$5.25
No.	5	6	7	8	
℔ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods ... 75@75&10%
Acme Fry Pans ... 66⅔%

Dust—

Steel Edge, No. 1 ... ℔ doz $1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, $2; 20, $2.25; 30, $2.50 each ... 60&10%

Paper and Cloth—

Sand and Emery—

List April 19, 1886 .... 50&10@50&10&10%
Sibley's Emery and Crocus Cloth ... 30%

Parers—

Apple—

Advance ... ℔ doz $4.75
Baldwin ... ℔ doz 5.25
Bonanza ... each 5.00
Daisy ... ℔ doz 4.00
Dandy ... each 7.50
Eclipse ... ℔ doz 4.25
Eureka, 1888 ... each 16.00
Family Bay State ... ℔ doz 12.00
Favorite ... ℔ doz 5.00
Gold Medal ... ℔ doz 4.00
Ideal ... ℔ doz 4.00
Improved Bay State ... ℔ doz 27.00@30.00
Little Star ... ℔ doz 4.50
Monarch ... ℔ doz 13.50
New Lightning ... ℔ doz 5.50
Oriole ... ℔ doz 4.00
Penn ... ℔ doz 4.00
Perfection ... ℔ doz 4.00
Pomona ... ℔ doz 4.00
Rocking Table ... ℔ doz 6.00
Turn Table ... ℔ doz 4.50
Victor ... ℔ doz 13.50
Waverly ... ℔ doz 4.00
White Mountain ... ℔ doz 4.00
72 ... ℔ doz 4.25
78 ... ℔ doz 7.00

Potato—

White Mountain ... ℔ doz $4.50
Antrim Combination ... ℔ doz $5.50
Hoosier ... ℔ doz $13.50
Saratoga ... ℔ doz $5.50

Pencils—

Faber's Carpenters' ... high list 50%
Faber's Round Gilt ... ℔ gro $5.25
Dixon's Lead ... ℔ gro $4.50
Dixon's Lumber ... ℔ gro $6.75
Dixon's Carpenters' ... 10%

Pencils, Soapstone—

See *Crayons.*

Pickers, Fruit—

Prize Fruit Pickers ... 50%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00 ... 60&10@60&10&10%

Picture Nails—

See *Nails, Picture.*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s ... 60&10%
Sargent & Co.'s, $17 and $18 ... 60&10%
Peck, Stow & W. Co. ... 50&10@50&10&5%

Curtain—

Silvered Glass ... net
White Enamel ... net

Escutcheon—

Iron, list Nov. 11, 1885 .. 50&10@50&10&5%
Brass ... 60@60&5%

Pipe, Wrought Iron—

List April 13, 1893.

1¼ and under, Plain ... 57½&10%
1¼ and under, Galv. ... 50&10%
1½ and over, Plain ... 67½&10%
1½ and over, Galv. ... 57½&10%
Boiler Tubes, list Oct. 24, 1892 ... 65&10%
Casing, list Nov. 16, 1892 ... 52½&10%
Inserted Joints Casing, list Nov. 16, 1892 ... 47½&5%
Steel Boiler Tubes ... 27½&5%
Cold Drawn Seamless Steel Tubing .. 50%

Planes and Plane Irons—

Wood Planes—

Molding ... 40@40&10%
Bench, First quality ... 45@45&10%
Bench, Second quality ... 50@50&10%
Bailey's (Stanley R. & L. Co.) .. 50&10%

Iron Planes

Bailey's (Stanley R. & L. Co.) ... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ... 25&10%
Steers' Iron Planes ... 50@50&5%
Meriden Mal. Iron Co.'s ... 50@50&5%
Davis' Iron Planes ... 55@50&5%
Birmingham Plane Co. ... 60@60&5%
Gage Tool Co.'s Self-Setting ... 20&10&10%
Chaplin's Iron Planes ... 50@50&5%
Sargent's ... 60@60&10%
Standard Tool Co. ... 50@50&5%

Plane Irons—

Butcher's ... $5.00@$5.25 to $
Buck Bros. ... 30%

Auburn Thistle ... }
Ohio ... } .30&10@30&10&10%
Sandusky ... }
L. & I. J. White ... 35%
Stanley R. & L. Co. ... 60&10%

Plates—

Felloe ... ℔ ℔ 6¢@5½¢

Pliers and Nippers—

Button's Patent ... 60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ℔ doz. ... 40%
Humason & Beckley Mfg. Co. 50@50&10%
Lindsay's Giant ... 33⅓%
Gas Pliers ... 60%
Gas Pliers, Custar's Nickel Plated .. 60&5%
Eureka Pliers and Nippers ... 40%
Russell's Parallel ... 25%
P., S. & W. Cast Steel ... 50%
P., S. & W. Tinners' Cutting Nippers, add 6% ... 10%
Carew's Pat. Wire Cutters ... 20%
Morrill's Parallel, ℔ doz, $12.00 ... 30&5%
Cronk's 8 in., $15.00; 10 in. ... 20%
Cronk's Button Pattern ... 50&10@60%
Cronk's Carrier Pliers ... 60@60&5%

Plumbs and Levels—

Regular List ... 75&10@75&10&5%
Stanley's Duplex ... 20&10%
Stanley's Handy ... 20&10%
Disston's ... 50%
Cook's ... 40&10%
Pocket Levels ... 70&10@70&10&10%
Davis Iron Levels ... 30%
Davis Inclinometers ... 10&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz, No. 1, $6.00; No. 2, $9.00 ... 33⅓%
Silver & Co., 6-Ring, ℔ doz, $4.00; 8-Ring ... $9.00

Pokes, Animal—

Bishop's I. X. L. ... ℔ doz $6.00
Bishop's Monarch ... ℔ doz $4.50
Bishop's Pioneer ... ℔ doz $4.00
Bishop's American ... ℔ doz $3.00
Eagle, Double Stale ... ℔ doz $5.75
Eagle, Single Stale ... ℔ doz $3.75
Buckeye, Single Stale ... ℔ doz $2.75
Bolding ... ℔ doz $6.00
Metallic Horse Poke ... ℔ doz., $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ℔ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ℔ doz 10%
Tower's ... 25%
Daley's Improved Handcuffs; 2 Hands, Polished, ℔ doz, $48.00; Nickeled, $57.00; 3 hands, Polished, ℔ doz, $72.00; Nickeled, $84.00 ... 25%
J. P. Lovell's Police Goods ... 25%

Polish—

Metal—

Prestoline ... 30%
Prestoline Paste ... 33⅓%
Gaston's Silver Compound ... 33⅓%

Stove—

Joseph Dixon's ... ℔ gro, $6.00, 10%
Gem ... ℔ gro, $4.50, 10%
Gold Medal ... ℔ gro, $6.00, 25%
Lustro ... ℔ gro, $4.75
Ruby ... ℔ gro, $3.75
Rising Sun, 5 gro lots ... ℔ gro $5.50
Dixon's Plumbago ... ℔ ℔ 8¢
Boynton's Noon Day ... ℔ gro $13.00
Parlor Pride Stove Enamel, ℔ gro
Yates' Liquid, 2 3 5 10 gal
℔ gal. ... $0.80 .70 .60 .50
Yates Standard Paste Polish, 10 ℔ cans, ℔ ℔ 12½¢
Jet Black ... ℔ gro $3.50
Japanese ... ℔ gro $3.50
Fireside ... ℔ gro $2.50
Diamond O. K. Enamel ... ℔ gro $19.00
Bonnell's Liquid Stove Polish, ℔ gro $9.00
Bonnell's Paste Stove Polish, ℔ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans ... 12½¢
Black Jack Water Paste, 5 and 10 ℔ cans ... 12½¢
Nickel Plate Paste ... ℔ gro $6.00
Crown Paste ... ℔ gro $7.20
Crown Paste in 5 and 10 ℔ pails, ℔ ℔ 12¢
Black Flag ... ℔ gro $7.20
Black Flag, 5 and 10 ℔ pails ... ℔ ℔ 12¢
Black Flag, liquid, in bottles, ℔ gro $8.00
Diamond Rock Nickel Cleaner ... ℔ gro $10.80
Raven Liquid, 6 oz. bottles ... ℔ gro $8.00
Raven Liquid, 8 oz. bottles ... ℔ gro $9.00
Raven Water Polish, large boxes ... ℔ gro $7.20
Raven Paste in 5 lb. pails (cases of 6 pails), ℔ ℔ 10¢

Poppers, Corn—

Round or Square,
1 qt. ... ℔ doz $1.00; ℔ gr $8.00
1½ qt. ... ℔ doz $1.00; ℔ gr $9.00
2 qt. ... ℔ doz $1.50; ℔ gr $14.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned ... 40&10@40&10&5%
Enameled ... 40&10@40&10&5%
Family, Howe's "Eureka" ... 40%
Family, L. F. C.'s "Handy" ... 50%

Powder—

In Canisters—

Fine Sporting, 1 ℔ each ... 0.90
Duck, 1 ℔ each ... .60
Rifle, 1 ℔ each ... .30
Rifle, ½ ℔ each ... .18

In Kegs—

Rifle, 25-℔ kegs ... $3.50
Rifle, 12½-℔ kegs ... 2.00
Rifle, 6¼-℔ kegs ... 1.15
Duck, 25-℔ kegs ... 11.00
Duck, 12½-℔ kegs ... 5.75
Duck 6¼ ℔ kegs ... 3.00

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. ... 25%
Lenis ... ℔ doz $3.50
Shepard's Queen City ... 40%
Silver & Co. ... ℔ doz $2.75

Pruning Hooks and Shears—See *Shears.*

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Pullers, Nail—

Scranton.. ....⅌ doz., $18.00, 33⅓%
Giant, No. 1..........⅌ doz., $18.00, 10%
Giant, No. 2..........⅌ doz., $15.00, 10%
Pelican..........⅌ doz., $9.00, 25%
Eclipse..........Each, $2.00, net
Economy...... ....⅌ doz., $6.00

Pulleys—

Hot House, Awning, &c..........66⅔@70%
Japanned Screw..........60&10&10%
Brass Screw..........70%
Japanned Side..........60&10&10%
Moore's Side, Anti Friction..........50%
Moore's Ceiling or End, Anti-Friction 40%
Moore's Dumb Waiter, Anti-Friction 50%
Moore's Electric Light 33⅓%
Japanned Clothes Line..........60&10%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50..........50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5.70..........50%
Hay Fork, "F" Common and Patent Bushed..........20%
Hay Fork, Tarbox Pat. Iron..........20%
Hay Fork, Reed's Self-Lubricating....60%
Hay Fork, Moore's Anti-Friction 5 in. Wheel, ⅌ doz., $12.00..........40%
Shade Rack..........45%
Tackle Blocks—See Blocks.
Shepard's Niagara, No. 25..⅌ doz 23¢ net
Sash (Auger Mortise).
Common Sense..........60%
Empire..........60%
Ideal, Nos. 2, 4, 10 & 15 / Acme.......... / Star.......... } 30% less 1¢ ⅌ doz net.
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. ..⅌ doz. 22¢ net.

Pumps—

Cistern, Best Makers.......... .60@60&10%
Pitcher Spout, Best Makers......67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—

Saddler's or Drive, good..⅌ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive.50&5%
Bemis & Call Co.'s Springfield Socket..65%
Spring, good quality..⅌ doz., $2.50@$2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring..........50&5%
Bemis & Call Co.'s Check..........55%
Solid Tinners', P., S. & W. Co., ⅌ doz., $1.44..........55%
Tinners' Hollow Punches, P., S. & W. Co..........20&2%
Rice Hand Punches..........15%
Avery's Revolving..........40%
Avery's Sawset and Punch—See Sawsets
Niagara Hollow Punches..........20&2%
Niagara Solid Punches..........55%

Rail—

Sliding Door, Wr't Brass....⅌ ℔, 35¢, 40%
Sliding Door, Bronzed Wr't Iron..⅌ ft., 7¢
Sliding Door, Iron, Painted..⅌ ft., 4¢, 40%
Barn Door, Light..In. ½ ⅝ ¾
Per 100 feet..........$2.00 2.50 3.10, 10%
S. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet......$3.15 2.70 3.25 Net
Terry's Steel Rail..........⅌ ft., 4½¢
Victor Track Rail, 7¢ ⅌ foot..........50&2%
Carrier, double braced, Steel Rail, ⅌ foot..........3½@4¢
Lundy Parlor Door, Planed Edge, ⅌ ft. 7¢
Moore's Steel Rail..........25&10%
Moody Steel Rail ⅌ ft., 5¢..........45%

Rakes—

Cast Steel, Association g'ds..70@70&5&2%
Cast Steel, outside g'ds,.......70@70&5&2%
Malleable..........70@70&5%
Gibbs' Lawn Rake..........⅌ doz., $4.90
Gibbs' Canton Lawn Rake...⅌ doz., $3.75
Gibbs' Acme Lawn Rake....⅌ doz., $4.75
Gibbs' Favorite Lawn Rake.⅌ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1.......... ⅌ doz., $4.90; No. 2, $5.40
Oneida Lawn Rake..........⅌ doz., $6.00
Fort Madison Prize Bow Brace and Peerless..........65%
Fort Madison Steel Tooth Lawn Rake, $6.00..........25%

Razors—

J. R. Torrey Razor Co 20%
Wostenholm and Butcher, $10 to £....10%
Jordan's AAA1, new list..........Net
Jordan's Old Faithful, new list..........Net
Galvanic..........⅌ doz., $15.00
Electric Cutlery Co.......... ....Net
Campbell Cutlery Co.......... ....50%

Razor Strops—

See *Strops, Razor.*

Registers —

Moore's Japanned..........75%
Moore's Electroplated..........75%
Moore's Bronze Finishes..........70%
Moore's Solid Bronze..........65%
Moore's Stove Pipe..........33⅓

Rings and Ringers—

Bull Rings—

Union Nut Co..........55%
Sargent's..........75&10%
Hotchkiss' low list..........30%
Humason, Beckley & Co.'s..........70&10%
Peck, Stow & W. Co.'s..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—

Top of the Hill Ringers..........⅌ doz $2.00
Top of the Hill Rings..........⅌ doz $1.25
Hill's Improved Ringers..........⅌ doz $1.25
Hill's Old Style Ringers..........⅌ doz $1.12½
Hill's Tongs ....⅌ doz $3.00
Hill's Rings..........⅌ doz bxs $1.00
Perfect Rings..........⅌ doz bxs $1.50
Perfect Ringers..........⅌ doz $2.15@$2.25
Blair's Hog Ringers..........⅌ doz $2.00
Blair's Hog Rings..........⅌ doz 90¢@$1.00
Champion Ringers..........⅌ doz $2.00
Champion Rings, Double..........⅌ doz $2.25
Brown's Ringers..........⅌ doz $2.00
Brown's Rings..........⅌ doz $1.15@$1.25
Electric Hog Rings..........⅌ doz boxes $1.50
Electric Hog Ringers..........⅌ doz $2.00
Major Rings..........⅌ doz $1.25
Major Ringers..........⅌ doz $2.00

Rivets and Burrs—

Norway Iron. list Nov. 17, '87....60&10%
Second quality..........70%
Copper ....60@60&10%
Coppered Iron, Bettina Brand......50&5%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—

Stair, Brass..........25@30%
Stair, Black Walnut.......... ⅌ doz 40¢

Rollers—

Barn Door, Sargent's list. ....60&10&10%
Acme Moore's Anti-Friction..........55%
Union Barn Door Roller..........70%
Moore's Barn Door Stay..........50%
Thompson Mfg. Co.'s Lawn Rollers ..30%

Rope—The following prices are f.o.b., New York or factory, and are shaded ¼¢@½¢ on large lots; terms, 1½% for cash.

Manila, 7-16 in. diam. and larger ⅌ ℔ 8¾¢
Manila..........⅜ in. ⅌ ℔ 9¼¢
Manila..........¼ and 5-16 in. ⅌ ℔ 9¾¢
Manila, Tarred Rope.......... ⅌ ℔ 8¼¢
Manila, Hay Rope.......... ⅌ ℔ 8¼¢
Sisal.......7-16 inch and larger ⅌ ℔ 7¼¢
Sisal..........⅜ in. ⅌ ℔ 8 ¢
Sisal..........¼ and 5-16 in. ⅌ ℔ 8½¢
Sisal, Hay Rope.......... ⅌ ℔ 7½¢
Sisal, Tarred Rope.......... ⅌ ℔ 7 ¢
Sisal, Medium Lath Yarn.......... ⅌ ℔ 7 ¢
New Zealand..7-16 in. & larger ⅌ ℔ 7 ¢
New Zealand..........⅜ inch, ⅌ ℔ 7¼¢
New Zealand..¼ and 5-16 inch, ⅌ ℔ 7¾¢
New Zealand, Hay Rope.......... ⅌ ℔ 6¾¢
New Zealand, Tarred Rope.... ⅌ ℔ 6¼¢
Cotton Rope..........⅌ ℔ 13½@16¢
Jute Rope.......... ....⅌ ℔ 6½@7¢

Wire—

List February, 1892. All kinds..........45%

Rules—

Boxwood......80&10&10@80&10&10&10%
Ivory..........50&10%
Starrett's Steel Rules and Straight Edges..........25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—

Disston's Circular..........45@45&5%
Disston's Cross Cut, list Jan. 1,'93.40&10%
Disston's Hand..........25%
Woodrough & McParlin.
Hand, Panel and Rip.......... ....25&10%
Cross Cuts, list Jan. 1, 1893......45&10%
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip..........30&10%
Cross Cuts, list Jan. 1, 1893......45&10%
Atkins' Circular.......... ....50&10%
Atkins' Cross Cuts, new list. 40%
Atkins' Mulay, Mill and Drag.....50&10%
Atkins' One-Man Saw..........40%
Atkins' Wood Saws..........40%
Peace Circular and Mill..........45@45&5%
Peace Hand Panel and Rip.....25@25&5%
Peace Cross Cuts, list Jan. 1,'93...45&10%
Richardson's Circular and Mill.45@45&5%
Richardson's X Cuts, list Jan. 1,'93.45&10%
Richardson's Hand, &c.......... .25@25&5%
C E. Jennings & Co.'s 25%

Hack Saws—

Griffin's, complete..........40&10@50
Griffin's Hack Saw Blades......40&10@50
Star Hack Saws and Blades..........25%
Eureka and Crescent..........25%

Scroll—

Lester, complete, $10.00..........25%
Rogers, complete, $4.00..........25%
Barnes' Builders' and Cab Makers' $15,25%
Barnes' Scroll Saw Blades..........35%

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—

Hatch, Counter, No. 171, good quality, ⅌ doz $18.00@$19.00
Hatch, Tea, No. 161....⅌ doz $6.50@$7.00
Union Platform, Plain..........$2.10@2.20
Union Platform, Striped......$2.40@2.50
Chatillon's Grocers' Trip Scales..........50%
Chatillon's Eureka..........25%
Chatillon's Favorite..........40%
Family, Turnbulls..........30@30&10
Riehle Bros.' Platform..........40%

Scale Beams—

See *Beams, Scale.*

Scissors, Fluting..........45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.00..........30&10%
Box, 1 Handle..........⅌ doz $2.25@$2.50
Box, 2 Handle..........⅌ doz $3.00@$3.25
Defiance Box and Ship.......... ....20&10%
Foot..........50&10&60%
Ship, Common.......... ....⅌ doz $3.50 net
Ship, R. I. Tool Co..........10%

Screen Window and Door Frames—See *Frames*

Screw Drivers—

See *Drivers, Screw*

Screws—

Bench and Hand—

Bench, Iron..........55&10@55&10&10%
Bench, Wood, Beech..........⅌ doz $2.25
Bench, Wood, Hickory..........20&10%
Hand, Wood..........25&10@25&10&5%
Hand, Grand Rapids, list..........35%

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890.......... 80@80&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890..........80@80&5%
Hand Rail, Sargent's..........70&10%
Hand Rail, H. & B. Mfg. Co....70&10@75%
Hand Rail, Am. Screw Co..........75%

Jack Screws—

Jack Screws, Millers Falls list.50@50&10%
Jack Screws, P., S. & W..........35%
Jack Screws, Sargent..........70%
Jack Screws, Stearns'..........40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's..........33⅓@33⅓&5%
Detroit Cork Screw Co..........33⅓%

Machine—

Flat Head Iron..........65%
Round Head Iron..........60%

Wood—

List January 1, 1891.

Flat Head Iron..........	70%	Extra 10 or 10& 10% often given.
Round Head Iron..........	65%	
Flat Head Brass..........	70%	
Round Head Brass..........	65%	
Flat Head Bronze..........	70%	
Round Head, Bronze: ...	65%	

Rogers' Drive Screws..........82½%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grain..........40&5@40&10%
Grass..........40&10&50%

Scythe Snaths—

See *Snaths, Scythe.*

Sets—

Awl and Tool—

Aiken's Sets, Awls and Tools, No. 20, ⅌ doz $10.00..........60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9..........45%
Millers Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18..........25%
Henry's Combination Haft...⅌ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50..........30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50...70&10&5%

Nail—

Square..........⅌ gr. $4.00@$4.25
Round..........⅌ gr. $3.25
Buck Bros..........27½%
Cannon's Diamond Point...⅌ gr. $12, 20%

Rivet—

Regular list.......... ....70%

Saw—

Stillman's Genuine....⅌ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ⅌ doz $3.25; Cross Cut, $6.50..........55@55&10%
Common Lever..........⅌ doz $2.00, 45@50%
Morrill's No. 1, $15.00..........40&20%
No. 11, $16.00..........40&20%
Nos. 3 and 4, Cross Cut, $23.00..40&20%
No. 5, Mill, $31.00..........40&20%
No. 10, $15.50..........40&20%
Leach's..No. 0, $8.00; No. 1, $15...15@20%
Nash's..........20&10@20&10&10
Hammer, Hotchkiss..........$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat.45%
Bemis & Call Spring Hammer......30&5%
Bemis & Call Co.'s Plate..........20%
Bemis & Call Co.'s Cross Cut..........30&5%
Aiken's Genuine..........$13.00, 55@55&10%
Aiken's Imitation..........$9.00, 55@55&10%
Hart's Pat. Lever..........20%
Disston's Star..........25%
Leopold..........40&10@50%
Atkin's Lever..........⅌ doz No. 1, $6.00
Atkin's Criterion..........⅌ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00..........40&10@50%
Avery's Saw Set and Punch..........50%
Kohler's Royal..........⅌ doz $7.00
Kohler's Giant Royal..........⅌ doz $12.00
Crescent..........⅌ doz $3.00
Lloyd's Acme..........⅌ doz $15, 40&10%
Taintor Positive..........⅌ doz $18, 50%

Sharpeners, Knife—

Larkins'.
Applewood Handles...⅌ doz. $6.00, 40%
Rosewood or Cocobola. ⅌ doz. $9.00 40%

Shaves, Spoke—

Iron..........45%
Wood..........30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'..........30&10%
Cincinnati..........25&10%
Goodell's ⅌ doz. $9.00..........25%

Shears—

American (Cast) Iron..75&10@75&10&5%
Barnard's Lamp Trimmers..⅌ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears..........33⅓%
Cast Steel Trimmers:
First quality..........80@80&10%
Second quality......80&10@80&10&10%
Acme Cast Shears..........10&10%
Diamond Cast Shears..........10%
Clipper..........10&10%
Victor Cast Shears......75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel..........40%
Hatch Cutlery Co., Solid Steel Forged.60%
Davenport Cutlery Co..........60@60&10%
Clauss brand, Japanned..........70%
Clauss brand, Nickeled, same list.....60%
Galvanic 3½ to 9 in., ⅌ doz. $1.00 ⅌ inch
Electric Cutlery Co ....Net
Campbell Cutlery Co., Jap'd.....75%
Nickel Plated..........65%

Tinners' Snips—

Wrt. Handles, Steel Blades. ..20@20&10%
Niagara Snips and Shears. ...20&10%
Cast Handles, Laid with Steel 40%

Pruning Shears and Hook

Disston's Combined Pruning Hook and Saw..........⅌ doz. $18.00, 20&10%
Disston's Pruning Hook, ⅌ doz. $12.00 20&10%
E.S.Lee & Co.'s Pruning Tools.50&10@70%
Pruning Shears, Henry's Pat., ⅌ doz. $3.75@$4.00
Henry's Pruning Shears, ⅌ doz. $4.25 @$4.[illegible]
Wheeler, M. & C. Co., Combination, ⅌ doz $12.00
Dunlap's Saw and Chisel, ⅌ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.[illegible]
P., S. & W. Co.......... ....60%
Levin Pruner No. 1, $15.00 ⅌ doz..40&[illegible]
Levin Pruner No. 2, $21.00 ⅌ doz...40&[illegible]

Tinners', &c.—

Shears and Snips (P. S. & W.)....20@[illegible]
Snips, J. Mallinson & Co..........33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888...50&10@60&[illegible]
R. & E., list Dec. 18, 1885..........55&20%
Corbin's list..........60&10&[illegible]
Patent Roller..........60&10&[illegible]
Patent Roller, Hatfield's..........75%
Russell's Anti-Friction, list Dec. 18, 1885..........60&[illegible]
Moore's Anti-Friction..........50%

Sliding Shutter—

R. & E., list Dec. 18, 1885..........60&10&[illegible]
Sargent's list..........70%
Reading list..........60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&[illegible]
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list).......... 20&10&[illegible]
Prize..........40&[illegible]
Star, Club, Rival and Climax Brands... 33⅓&10&[illegible]
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&[illegible]
Trap brand, 12 and 10 gauge..33⅓&10&[illegible]
Seibold's Comb. Shot Shells..........15&[illegible]
Brass Shot Shells, 1st quality..........60&[illegible]
Brass Shot Shells, Club, Rival, Climax. 65&[illegible]

Shells, Loaded—

Standard List, July 19, 1890.......... 40&10&10@40&10&10&5
7% cash, 10 days.

Ship Tools—

L. & I. J. White..........20&[illegible]

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix, Standard, Diamond State, Bryden's Boss and Crescent, at factory..........$4.00
Bryden's Frog Pressure, at factory..$5.00

Mule—

Add $1 ⅌ keg to above prices.

Ox Wrought—

Ton lots..........⅌ ℔ 9¢
1000 ℔ lots..........⅌ ℔ 9½¢
500 ℔ lots..........⅌ ℔ 10¢

Shot—

	Small lots.	
Drop, up to B, 25-℔ bag..........	$1.45	In ton lots a discount of 5¢ ⅌ bag (25 ℔) is made.
Drop, up to B, 5-℔ bag..........	.35	
Drop, B and larger, 25-℔ bag..........	1.70	
Drop, B and larger, 5-℔ bag..........	.40	
Buck and Chilled, 25-℔ bag..........	1.70	
Buck and Chilled, 5-℔ bag	.40	
Dust Shot, 25-℔ bag..........	2.00	
Dust Shot, 5-℔ bag..........	.45	

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885..........[illegible]
Note.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron..........50&10%
Griffith's C. S..........60@60&5%
Griffith's Solid C. S. R. R. Goods..........20%
St. Louis Shovel Co..........20@20&7½%
Hussey, Binns & Co..........15@[illegible]
Hubbard & Co.... ....20@20&7½%
Lehigh Mfg. Co..........50&10%
H. M. Myers Co..........30%
Payne Pettebone & Son..........33⅓&5%
Remington's (Lowman's Pat.)40&10@50%
Rowland's Black Iron..50&10@50&10&5%
Rowland's Steel..........60&5@60&10%
Terra Haute Shovel & 25%

Shovels and Tongs—

Iron Head..........60&10@60&10&5%
Brass Head..........60&10&10%

Sieves and Sifters—

Mann's Tin Rim.......... 50&25%
Buffalo Metallic, S. S. & Co....50&25&20%
Shaker (Barler's Pat.) Flour Sifters ⅌ gr $21.00
Electric Light..⅌ doz $1.50; ⅌ gro $15.00
A. & W. Sifters..........⅌ gr $15.00
Hunter's Genuine. ⅌ doz $1 75, ⅌ gr $16.50
Hunter's Imitation.......... ⅌ doz $1.75; ⅌ gr $15.00

Sieves, Wooden Rim—

	Iron	Plated
Mesh 18, Nested, ⅌ doz....	$0.80	$1.00
Mesh 20, Nested, ⅌ doz....	.95	1.10
Mesh 24, Nested, ⅌ doz..	1.15	1.25

Sinks, Wrought Steel—

Columbus, Painted or Unpainted.......... 30@30&10%
Columbus, Galvanized and Enameled. 50@50&10%
New Era, Painted..........40&10@50&5%
New Era, Galvanized and Enameled... 60&10&10@70&5%

Skeins, Thimble—

Western list..........75&5@75&10%
Columbus Wrt. Steel..Special net prices
Coldbrookdale Iron Co..........60%
Seneca Falls Pattern..........60%
Utica P. S. T. Skeins..........60%
Utica Turned and Fitted..........[illegible]

Slates—

School, by case.......... ....40&10@50%
Large lots..........50&10&10%

Slaw Cutters—See *Cutters.*

Sleds Hand—

Tubular Steel.......... .⅌ doz $24.00 40&50
Lots of 6 doz 50%)

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.)....60%
Fitch's (Bristol)....50&10%
Hotchkiss....10%
Andrews....50%
Sargent's Patent Guarded....70&10&10%
German, new list....40&10%
Covert....50&10&5&2%
Covert, New Patent....50&10&5&2%
Covert, New R. E....60&10&5&2%
Covered Spring....60&10&10%
Covert's Saddlery Works' Triumph 33⅓%
John Protz Snaps....75@75&5%
Kelley & Woolworth's Steel Harness... 50&10@60%

Snaths—
Scythe....50&2@50&5&2%

Soldering Irons—
See *Irons, Soldering.*

Spittoons, Cuspidors, &c.
Standard Fiberware—
Cuspidors, 8½-inch, ℔ doz., No. 5, $8; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

Spoke Shaves—
See *Shaves, Spoke.*

Spoke Trimmers—
See *Trimmers, Spoke.*

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.... 70&10%
Buffalo, S. S. & Co....33⅓&2%

Silver Plated—
4 months or 5% cash 30 days:
Meriden Brit. Co., Rogers....40&15%
C. Rogers & Bros....40&15%
Rogers & Bros....40&15%
Reed & Barton....40@40&5%
Wm. Rogers Mfg. Co....40, 15&5%
Simpson, Hall, Miller & Co....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son....50&12½%

Miscellaneous—
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver....50&10&5%
No. 30 Silver Metal....50&10&5%
No. 24 German Silver....50&10&5%
No. 50 Nickel Silver....50&5%
No. 49 Nickel Silver....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal....50&10&6%
18% Rogers' German Silver....60&6%
22% Rogers' Nickel Silver....60&6%
German Silver....50@50&5%
German Silver, Hall & Elton..50&5% cash
Nickel Silver....50&5@50&10&5% cash
Brittannia....60@60&5%
Boardman's Nickel Silver, list July 1, 1891....60&7½&5%
Boardman's Brittannia Spoons, case lots....60&5% cash

Springs—
Door—
Torrey's Rod, 39 in....℔ doz $1.20@1.2
Warner's No. 1, ℔ doz $1.50; No. 2, $8.40....55@55&10%
Gem (Coil), list April 19, 1886....20%
Star (Coil), list April 19, 1886....20&10%
Victor (Coil)....60&10@60&10&5%
Champion (Coil)....60&10@60&10&10%
Cowell's, No. 1, ℔ doz $18.00; No. 2, $15.00....50@50&10%
Rubber, complete, ℔ doz $4.50....55&10%
Hercules....50@50&10%
Phœnix....33⅓%

Carriage, Wagon, &c.—
Elliptic, Concord, Platform and Half Scroll .... 60&10@60&10&10&10 or net prices
Cliff's Bolster Springs....25%

Squares—
Steel and Iron....
Nickel-Plated.... ..80&10&10@80&25%
Try Square and T Bevels....60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares....40%
Avery's Bevel Protractor....50%

Squeezers—
Fodder—
Blair's....℔ doz $2.00
Blair's "Climax"....℔ doz $1.25

Lemon—
Porcelain Lined, No. 1....℔ doz $6.00 25&30%
Wood, No. 2....℔ doz $3.00, 35%
Wood, Common....℔ doz $1.70@1.75
Dunlap's Improved....℔ doz $3.75, 20%
Sammis....No. 1, $5,00; No. 2, $9; 12, $18 ℔ doz....25&10%
Jennings' Star....℔ doz $2.50
The Boss....℔ doz $2.50
Dean's..Nos. 1, ℔ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50 50@50&5%
Little Giant....40&5%
King....
Hotchkiss Straight Flash....℔ doz $12.00
Silver & Co., Glass....℔ gro. $9.00

Standard Fiber Ware—
See *Ware, Standard Fiber.*

Staples—
Barbed Blind, ½ in. and larger, ℔ 7@7½¢
Barbed Blind, ¾ in.... ℔ 8@8½¢
Fence Staples, Galvanized. } Same price
Fence Staples Plain } as B'rb Wire
See Trd. Rep
Grand Crossing Tack Co.'s list.. 75&10%

Steelyards....40&10@50%

Stocks and Dies—
Blacksmith's:
Waterford Goods....35%
Butterfield's Goods....35%
Lightning Screw Plate....25@30%
Reece's New Screw Plates....25@30%
Reversible Ratchet....30%
Gardner....25%
Green River....25@30%

Stops, Bench—
Morrill's, ℔ doz. No. 1, $10.00; No. 2, $11.00 40&20%
Hotchkiss'....℔ doz $5, 10@10&10%
Weston's, No. 1 & No. 2, $9, 25&10&5

McGill's, ℔ doz $3....10
Cincinnati....25&10
Terrell's Nos. 1 and 2, ℔ doz., $3; No. 3, $3.60....80%
Millers Falls....25%
Stearns'....20&10%

Stone—
Stones, Grind—See *Grindstones.*
Scythe Stones—
Pike Mfg. Co., list April, 1892....33⅓%
Cleveland Stone Co., list Nov. 1892..33⅓%

Oil Stones, &c.—
Pike Mfg. Co:
Hindostan No. 1, ℔ doz....8¢ } 40 @ 40&10%
Sand Stone....5¢
Turkey Oil Stone, 4 to 8 in....80¢
Turkey Slips....$2.00
Lily White Washita....60¢ } 33⅓@33⅓&10%
Rosy Red Washita....60¢
Washita Stone, Extra....50¢
Washita Stone, No. 1....40¢
Washita Stone, No. 2....30¢
Lily White Slips....90¢
Rosy Red Slips....90¢
Washita Slips, Extra....80¢
Washita Slips, No. 1....70¢
Arkansas Stone, No. 1, 3 to 5½ in., $2.80
Arkansas Stone, No. 1 5½ to 8 in., $3.50
Lake Superior....℔ ℔ 13¢
Lake Superior Slips....℔ ℔ 20¢

Stove Polish—
See *Polish, Stove.*

Stretchers Carpet—
Cast Steel, Polished....℔ doz $2.2
Cast Iron, Steel Points....℔ doz 75@80¢
Socket....℔ doz $1.75
Bullard's....25@25&10%

Strops, Razor—
Genuine Emerson....60@60&5%
Imitation " ..℔ doz $2.00, 20&10&5%
Torrey's....20%
Badger's Belt and Com....℔ doz $2.00
Lamont Combination....℔ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co....Net
Campbell Cutlery Co....Net

Stuffer, Sausage—
Miles' Challenge, ℔ doz $20....50@50&5%
Perry....℔ doz, No. 1, $15.00; No. 0, $21.00....50&5@50&10%
Draw Cut No. 4, each $30.00....20%
Enterprise Mfg. Co., list Jan 17, '93..25%
Silver's....40&10%

Sweepers, Carpet and Lawn—
Carpet—
Bissell No. 5....℔ doz $17.00
Bissell No. 8....℔ doz $20.00
Bissell, Grand....℔ doz $36.00
Standard....℔ doz $24.00
Domestic....℔ doz $21.00
Domestic, No. 2....℔ doz $22.00
Grand Rapids....℔ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic....℔ doz $15.00
Improved Parlor Queen,
Nickeled....℔ doz $27.00
Japanned....℔ doz $24.00
Excelsior....℔ doz $22.00
Garland....℔ doz $18.00
Parlor Queen....℔ doz $24.00
Housewife's Delight....℔ doz $15.00
Ladies' Friend....℔ doz $15.00
Ladies' Friend No. 2....℔ doz $16.00
Advance....℔ doz $18.00
Our Leader....℔ doz $19.00
Triumph....℔ doz $20.00
Goshen....℔ doz $21.00
Supreme....℔ doz $22.00
Easy....℔ doz $22.00
Gilt Edge....℔ doz $24.00
Acme....℔ doz $26 00
Imperial....℔ doz $26.00
Grand Republic....℔ doz $30.00
Banner....℔ doz $22.00
The Star....℔ doz $21.00
Reliable....℔ doz $22.00
The Rapid....℔ doz $22.00
Our Own....℔ doz $27.00
Model....℔ doz $27.00
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months....℔ doz $1.00
10 dozen in 6 months....℔ doz $2.00
25 dozen in 6 months....℔ doz $3.00
Except on L.F., when 10 dozen price is $13.50, and 25 dozen $13.00.

Lawn—
Thompson Mfg. Co....30%

Swings—
Davies Lawn....25%

Tacks, Brads &c.—
List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.
Carpet Tacks—
American, Blued....66⅔%
American, Tin'd and Cop'd....70%
Steel, Bright and Blued....66⅔%
Steel, Tinned and Coppered....70%
Swedes Iron, Blued....72½%
Swedes Iron, Tinned....75%
American Iron Tacks, Domestic.66⅔%
Swedes Iron Tacks—
S. S., Blued....66⅔%
S. S., Tinned....70%
Lanc., Blued....55%
Lanc., Tinned....60%
Gimp and Lace Tacks—
S. S., Blued....62½%
S. S., Tinned....66⅔%
Lanc., Blued....55%
Lanc., Tinned....60%
Basket and Trimmers' Tacks—
Lanc....52½%
S. S....55%
Hungarian Nails....60%
Common and Patent Brads....55%
Leathered Tacks....10%
Brush Tacks, S. S....60%
Looking Glass Tacks, S. S....35%
Picture-Frame Points, S. S....35%
Finishing Nails....60%
Trunk and Clout Nails—
Black....65%
Tinned or Coppered....67½%
Basket Nails....60%
Chair Nails....52½%
Cigar Box Nails....45%
Tin Capped Nails....50%
(Extra discount 25&2%)

Miscellaneous—
Double Point....90@90&10%
Wire Carpet Nails....50&10%
Claw Handle Carpet....℔ gross $4 00
Bennie Blue....℔ box 1.50

Bill Nye Brad Box....4 00
Parisian Gilt Nails, cartoon....50
Home Tacks, No. 50 ℔ case (12 cartons), $36.00; No. 100, ℔ case (12 cartons), $72.00. } 50&2%
Home Nails, No. 200, ℔ case (12 cartons), $30.00; No. 400, ℔ case (12 cartons), $6 00.
Upholsterers' Nails....50&10%

Wire Brads and Nails
Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%
See also *Nails, Wire.*

Tanks, Oil—
Emerald, S. S. & Co.: 30-gal. $8.75; 60-gal., $11 each....50&10&5%

Tapes, Measuring—
American....40@40&5%
Spring....40%
Chesterman's, Regular list....25@30%

Thermometers—
Tin Case....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.
Standard Wire, list....50&10&5%

Tinners' Shears, &c.—
See *Shears, Tinners' &c.*

Tinware—
Stamped, Japanned and Pieced, list Jan 20, 1887....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—
See *Cutters, Tobacco.*

Tools—
Coopers'—
Bradley's....20%
Barton's....20@20&5%
L. & I. J. White....20&5%
Albertson Mfg. Co....25%
Beatty's....30%
Sandusky Tool Co....30@30&5%
Shaves Cincinnati Tool Co....20%

Lumber—
Ring Peavies, "Blue Line"..℔ doz $20.00
Ring Peavies, Common....℔ doz $18.00
Steel Socket Peavies....℔ doz $21.00
Mall. Iron Socket Peavies...℔ doz $19.00
Cant Hooks, "blue Line"....℔ doz $16.00
Cant Hooks, Common Finish..℔ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish....℔ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish....℔ doz $14.00
Cant Hooks, Clip Clasp, Common Finish....℔ doz $12.00
Hand Spikes....℔ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ℔ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ℔ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ℔ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ℔ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks....℔ doz $18.00

Saw—
Atkins', new list....40%

Transom Lifters—
See *Lifters, Transom.*

Traps—
Game—
Newhouse....40@40&5%
Oneida Pattern....70&10%
Game, Blake's Patent....40&10&5%

Mouse and Rat—
Mouse Wood, Choker, ℔ doz holes, 9@10¢
Mouse, Round Wire....℔ doz $1.50 10%
Mouse, Cage, Wire....℔ doz $2.50 10%
Mouse, Catch-'em-alive..℔ doz $2.50 15%
Mouse, Bonanza....℔ doz 0.90@$1.00
Rat, Decoy....℔ gr $10.00, 10%
Ideal....℔ gr $10.00
Cyclone....℔ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ℔ doz., 75¢; in full cases, ℔ doz. 60@65¢
Hotchkiss Imp. Rat Killer...℔ gro $13.50
Hotchkiss New Rat Killer...℔ gro $16.50
Schuyler's Rat Killer....℔ gro. $15.00
Dandy....℔ doz.. $1.75
Waddel's Go Bang, ℔ gro....$12.50

Fly—
Harper, Champion or Paragon ... ℔ doz. $1.75, ℔ gro. $16.50
Balloon, Globe or Acme ... ℔ doz. $1.50, ℔ gro. $13.50

Triers—
Butter and Cheese....25%

Trimmers, Spoke—
Bonney's....℔ doz $10.00, 50%
Stearns'....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ℔ doz. 55&10%
Douglas'....℔ doz $9.00, 20%
Cincinnati....25%

Trowels—
Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering....15%
Disston's Br'k and Plastering.25@25&10%
Peace's Plastering....25@25&5%
Clement & Maynard's....20@20&5%
Rose's Brick....15@20%
Brade's Brick....25%
Worrall's Brick and Plastering....20%
Garden....70%
Cleves' Angle Trowel, ℔ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list....40%
Thompson Mfg. Co....40%
Barnes' Barrel Trucks....40%

Tubes Boiler—
See Pipe

Twine—
Flax Twine—

	DC.	B.
No. 9, ¼ and ½ ℔ Balls	25¢	31¢
No. 12, ¼ and ½ ℔ Balls	22¢	30¢
No. 18, ¼ and ½ ℔ Balls	20¢	29¢
No. 24, ¼ and ½ ℔ Balls	20¢	29¢
No. 36, ¼ and ½ ℔ Balls	18¢	28¢

No. 264 Mattrass, ¼ and ½ ℔ Balls, 52@54¢
Chalk Line, Cotton, ½ ℔ Balls....28¢
Mason Line, Linen, ½ ℔ Balls....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)....15½¢
3-Ply Hemp, 1 ℔ Balls....16¢@16½¢
3-Ply Hemp, 1½ ℔ Balls....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔..15¢@16¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls....10¢
Wool....6½¢@5½¢
Paper....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ℔ to doz..18¢

Vises—
Solid Box....50&10@60%

Parallel—
Fisher & Norris Double Screw....15&10%
Stephens'....25@30%
Parker's....20@25%
Wilson's....55%
Howard's....40%
Bonney's....60%
Millers' Falls....40@40&10%
Trenton....40&5@40&10%
Merrill's....15@20%
Hollands'....35@40%
Sargent's....70&10%
Backus and Union....40%
Double Screw Leg....15&10%
Prentiss....20@25%
Simpson's Adjustable....40%
Moore's....20%
Massey Quick Action....20@35%

Saw Filers—
Bonney's, Nos. 2 & 3, $15.00....40&10@50
Stearn's....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises....33⅓@35%
Hopkins'....℔ doz $17.50, 10%
Reading....40&10%
Wentworth....20&10%
Economy, ℔ doz., Nos. 110, $10.00; 120, $15.00....50&10&10&5%

Miscellaneous—
Phœnix Vises....33⅓%
Phœnix Hand Vises....℔ doz $3.60, 33⅓%
Cowell Hand Vises....20%
Bauer's Pipe Vises....10%
Cincinnati....35&10%
Enterprise Pipe Vises.. each $3.00, 40%
Massey Combination Pipe Vise....40%

Wads—Price Per M.
U.M.C.&W.R.A.—B. E., 11 up.. 68¢ } Dis. 30&5%
U.M.C.&W.R.A.—B. E., 9&10.. 82¢
U.M.C.&W.R.A.—B. E., 8.... 96¢
U.M.C.&W.R.A.—B. E., 7....$1.10
U.M.C.&W.R.A.—P. E., 11 up. 1.15
U.M.C.&W.R.A.—P. E., 9&10.. 1.50
U.M.C.&W.R.A.—P. E., 8.... 1.70
U.M.C.&W.R.A.—P. E., 7.... 1.80
Eley's B. E., 11 and larger....$1.70@$1.75
Eley's P. E., 12 to 20.... 3.00@ 3.20

Wagon Boxes—
See *Boxes, Wagon.*

Wagon Jacks—
See *Jacks, Wagon.*

Ware, Hollow—
Cast Iron, Hollow—
Stove Hollow-Ware—
Ground....60&10@60&10&10%
Unground....65&10@70&5%
White Enameled Ware—
Maslin Kettles....70&10@75%
Boilers and Saucepans....60@60&5%
Tinned Boilers and S'pans....60@60&5%
Rustless Hollow Ware....50@50&5%
Gray Enameled Ware—
Stove....50%
Maslin Kettles....60&60&10%
Boilers and Saucepans....40&5%

Enameled—
Agate and Granite Ware, list Jan. 1, 1889....33⅓% } Extra 10% on some leading articles.
Ironclad Enameled Ware....dis 33⅓&10%

Kettles—
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Doz. Plain.	Decorated.
Wash-Basins, 10½ in....	$1.80	2 00
Wash-Basins, 12 in....	2.00	2.50
Keelers, 11¼ in....		3.50
Cuspidors....		7.50
Spittoons, "Daisy," 8 in.	3.50	4.00
Peck Measure....	3.50	
Half-peck Measure....	3.00	

See also Pails.

Indurated Fiber.—
Spittoons No. 2, ℔ doz....$6.00
Basins, Ringed, ℔ doz., No. 2....2.80
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ℔ nest....$5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ℔ nest....$2.55 } 50&5%
Butter Bowls 15, 17 and 19-inch (3 pieces), ℔ nest....$1.50
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces), ℔ set....$1.20
See also Pails.

Silver Plated, Hollow—
4 mo. or 5% cash in 30 days.
Reed & Barton....
Meriden Britannia Co....
Simpson, Hall, Miller & Co.... } 40&5%
Rogers & Brother....
Hartford Silver Plate Co.... } 40&5&5%
William Rogers Mfg. Co....

Washers—
Size hole.... 5-16 ⅜ ½ ⅝ to 1¼
Washers.... 5½ 4½ 3½ 2½
In lots less than 200 ℔, ℔ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Washer Cutters—
See *Cutters, Washers.*

Water Coolers—
See *Coolers, Water.*

Wedges—
Iron....℔ ℔ 3½¢
Steel....℔ ℔ 3½¢

Weights, Sash—
Solid Eyes....℔ ton $18.00@$19.00

Well Buckets Galvanized—See *Buckets, Well, Galvanized.*

Wheels Well—
8 in., $2.00 10 in. $2.50 12 in $3.7

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving...	$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.	....	....	15.00	16.50	18.00	20.00	....	....
Bull Bone, Half-length Whalebone.	....	....	11.00	12.00	13.00	15.00	....	....
American Standard	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center	6.00	6.00	6.50	7.00	7.50	9.00	....	....
New Name, Stocked Java, Black and Wine Colors	....	....	....	6.00	....	....	....	....
Americus, 93 Pen Whip	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 111	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 106	....	....	....	5.00	....	....	....	....
Hand-made Stocked Java No. 103	....	....	3.75	4.00	....	....	....	....

Per dozen.

A large variety of cheaper grades.....$4.00@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....⅋ gro. $2.50@$12.00
Hardware Assortment, 10/American, 75 Whips for $50.00.

Wire and Wire Goods—

Iron—

Market,

Br. & Ann., Nos. 0 to 18. 75&10@75&10&5%
Cop'd, Nos. 0 to 18. 75&5%
Galv., Nos. 0 to 18 ..... 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18.....70@70&10%
} Extra 5@10% often given and net prices often made on large lots.

Stone,
Br. and Ann'd,
Nos. 16 to 18.... ....80%
Nos. 19 to 26... ..80&5%
Nos. 27 to 36...82½&5%
} Extra 10% often given.
Tinned Broom Wire, 18 to 21, ⅋ ℔....4¾¢
Galvanized Fence .....75&10%
Brass, list Jan. 18, 1884.....40&5%
Copper, list Jan. 18, 1884.....40@5%
Annealed Wire on Spools 60%
Malin's Annealed & Tin'd on Spools..60&5%
Malin's Brass and Cop. on Spools...50&5%
Ossawan Mills, An'ld and Tinned on Spools.....60&10%
Ossawan Mills, Brass and Copper on Spools.....50&10%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass 50%
Cast Steel Wire 50%
Stubs' Steel Wire.....$6.00 to 2, 30%
Steel Music Wire, 12 to 30, imported.... 60@70¢ ⅋ ℔
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list.....85@85&10%

Wire Cloth and Netting—

Painted Screen Cloth⅋ 100 ft.$1.75@$2.00
Galvanized Wire Netting.....75@75&10%

Wire Barb—

See Trade Report.

Wire Rope—See *Rope, Wire.*

Wrenches—

American Adjustable 40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine .....50@50&10%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....
} 75&10@80%

Bemis & Call's:
Pat. Combination Bright .....40&5%
Pat. Combination Black.....40 & 10%
Merrick's Pattern.....45%
Brigg's Pattern.....30&10%
Cylinder or Gas Pipe.....45&5%
No. 3 Pipe 55%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....⅋ doz., $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's 30%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....50&10%
Acme, Bright.....50&5%
Acme, Nickeled.....40&5%
Hercules.....70@70&5%
Walker's.....55&5%
Diamond Steel.....55&5%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&5%

Wringers, Clothes—

Am. Wringer Co.'s list, July 1, '93..2% cash
Colby Wringer Co., list Sept. 1, '91..2% cash
Lovell Mfg. Co., list July 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....8% Cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1893 85&10@85&15

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw.. per gal.	..	@	50
Linseed, City, boiled....	..	@	53
Linseed, Western, raw.....	48	@	50
Lard, City, Extra Winter...	75	@	76
Lard, City Prime.....	74	@	75
Lard, City, Extra No. 1.....	65	@	..
Lard, City, No. 1.....	55	@	..
Lard, Western, prime.....	73	@	75
Cotton-seed, Crude, prime..	37	@	38
Cotton-seed, Crude, off grades.....	34	@	36
Cotton-seed, Summer Yellow, prime.....	42	@	43
Cotton-seed, Summer Yellow, off grades.....	40	@	41
Sperm, Crude	85	@	90
Sperm, Natural Spring.....	..	@	..
Sperm, Bleached Spring.....	..	@	..
Sperm, Natural Winter.....1.00		@	1.03
Sperm, Bleached Winter....1.05		@	1.08
Whale, Crude	..	@	..
Whale, Natural Winter.....	55	@	56
Whale, Bleached Winter....	..	@	58
Whale, Extra Bleached.....	59	@	60
Sea Elephant, Bleached Winter.....	..	@	..
Menhaden, Crude, Sound...	40	@	..
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed...	42	@	43
Menhaden, Bleached W'ter.	45	@	..
Menhaden, Extra Bleached.	48	@	..
Tallow, City, prime.....	60	@	65
Tallow, Western, prime....	..	@	60
Cocoanut, Ceylon.....	..	@	6
Cocoanut, Cochin.....	..	@	6¾
Cod, Domestic.....	38	@	40
Cod, Foreign.....	42	@	45
Red Elaine	44	@	46
Red Saponified.....⅋ ℔	5¼	@	5½
Bank ..... per gal	40	@	41
Straits.....	41	@	42
Olive, Italian, bbls.....	58	@	60
Neatsfoot, prime.....	75	@	80
Palm, prime, Lagos.....⅋ ℔	7¾	@	8¼

Mineral Oils—

Black, 29 gravity, 25 @ 30 cold test.....per gal	7	@	7½
Black, 29 gravity, 15 cold test	7½	@	8
Back, 29 gravity, summer...	6	@	6½
Cilinder, light, filtered.....	14	@	16
Cylinder, dark, filtered.....	10	@	13
Paraffine, 23½ @ 24 gravity..	11	@	12
Paraffine, 25 gravity.....	10	@	11
Paraffine, 28 gravity.....	7½	@	8
Paraffine, red.....	9½	@	10½

Paints and Colors—

Barytes, Foreign, ℔ ton..$22.00		@	24.00
Barytes, Amer. floated....29.00		@	32.00
Barytes, Amer. No. 1.....16.00		@	18.00
Barytes, Amer. No. 2.....13.00		@	15.00
Barytes, Amer. No. 3.....11.00		@	12.00
Blue, Celestial.....⅋ ℔	6	@	8
Blue, Chinese.....	40	@	50
Blue, Prussian.....	25	@	40
Blue, Ultramarine.....	8	@	25
Brown, Spanish....	⅛	@	1
Brown, Vandyke, Amer...	3	@	3½
Brown, Vandyke, English.	6	@	8
Carmine, No. 40, in bulk..	2.75	@	..
Carmine, No. 40, in boxes or barrels.....	2.85	@	..
Carmine, No. 40, in ounce bottles.....	3.75	@	..
Chalk, in bulk.....⅋ ton..	2.40	@	2.50
Chalk, in bbls..⅋ 100 ℔...	33	@	40
China Clay, English..... ⅋ ton.13.00		@	18.00
Cobalt Oxide, prep'd.....	9.00	@	11.00
Cobalt Oxide, black..... lots 100 ℔.	1.90	@	....
Cobalt Oxide, black..... less 100 ℔.	1.96	@	....
Green, Paris, in bulk.....	10	@	10½
Green, Paris, 170 @ 175 ℔ kegs.....	10½	@	11
Green, Paris, small pack.	12	@	17
Green, Chrome, ordinary.	6	@	12
Green, Chrom., pure.....	22	@	25
Lead, Eng., B.B. white....	8½	@	10
Lead, Amn. White, dry or in oil:			
Kegs, lots less than 500 ℔...	7	@	7¼
Kegs, lots 500 ℔ to 5 tons....	6½	@	6¾
Kegs, lots 5 tons to 12 tons..	6⅜	@	6⅝
Kegs, lots 12 tons and over..	6¼	@	6½
Lead, White, in oil, 25 ℔ tin pails, add to keg price.....	..	@	⅛
Lead, White, in oil. 12½ ℔ tin pails, add to keg price.....	..	@	1
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price.	..	@	2½
Lead, Red, bbls. and ½ bbls...	6	@	7
Lead, Red, kegs.....	6¼	@	7¼
Litharge, kegs	6¼	@	7¼
Litharge, bbls. and ½ bbls.....	6	@	7

TERMS, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1½
Ocher, French Washed.....	1½	@	2½
Ocher, German Washed....	1¼	@	3
Ocher, American.....	½	@	1½
Orange Mineral, English....	8½	@	9
Orange Mineral, French.....	10	@	10½
Orange Mineral, German....	8½	@	9
Orange Mineral, American.	8¼	@	8¾
Paris White, English Cliffstone	1.00	@	1.15
Paris White, American.....	65	@	75
Red, Indian, English.....	5½	@	7
Red, Indian, American.....	2	@	6½
Red, Turkey.....	9	@	14
Red, Tuscan.....	9	@	11
Red, Venetian, American... ⅋ 100 ℔..1.00		@	1.10
Red, Venetian, English.....1.20		@	1.35
Sienna, Italian, Burnt and Powd. ⅋ ℔	4	@	5
Sienna, Ital., Burnt Lumps.	1½	@	3½
Sienna, Ital., Raw, Powd...	4½	@	5½
Sienna, Ital., Raw, Lumps..	1¾	@	3½
Sienna, American, Raw.....	1½	@	1¾
Sienna, American, Burnt and Powdered .....⅋ ℔	1½	@	1¾
Talc, French.....	..	@	1¼
Talc, American.....	1¼	@	1⅜
Terra Alba, Fr'ch. ⅋ 100 ℔	95	@	1.25
Terra Alba, English.....	70	@	80
Terra Alba, American No. 1	65	@	75
Terra Alba, American No. 2	45	@	50
Umber, Turkey, Burnt and Powdered .....⅋ ℔	3½	@	4
Umber, Turkey Bnt. Ln.....	2¾	@	3
Umber, Turkey, Raw and Powdered	3¼	@	..
Umber, Turkey, R'w Lumps	2¼	@	2¾
Umber, Turkey, Bnt. Amer..	1¼	@	1½
Umber, Turkey, R'w Amer.	1¼	@	1½
Yellow, Chrome	10	@	25
Vermilion, American Lead.	11¼	@	12
Vermilion, Quicks'er, bulk..	57	@	..
Vermilion, Quicks'er, bags..	58	@	..
Vermilion, Quicksilver sm'r pkgs	62	@	..
Vermilion, English Import.	85	@	90
Vermilion, Imitation, Eng..	8	@	35
Vermilion, Trieste.....	90	@	92½
Vermilion, Chinese.....	92½	@	95
Whiting Common, ⅋ 100 ℔	37½	@	42½
Whiting Gilders'.....	45	@	55
Zinc, American, dry....⅋ ℔	4¼	@	..
Zinc, French, Red Seal.....	7⅞	@	.
Zinc, French, Green Seal	9	@	..
Zinc, French, V. M. X.	..	@	7
Zinc, Antwerp, Red Seal....	7½	@	..
Zinc, Antwerp, Green Seal..	7¾	@	..
Zinc, German, L. Z. O.....	6¾	@	7¼
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over	10¾	@	11¼
lots less than one ton.....	11	@	11¾
Zinc, V. M. in Poppy Oil, Red Seal	..	@	..
lots of 1 ton and over.....	10	@	10¼
lots of less than 1 ton.....	10¼	@	10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls., 2%; 50 bbls. 4%. No discount allowed on less than bbl. lots.

Colors in Oil—

Black, Drop, Frankfort.....	25	@	30
Black, Drop, English.....	12	@	15
Black, Drop, Domestic.....	7	@	10
Black, Lampblack, Best	20	@	35
Black, Lampblack, Common	7	@	18
Black, Ivory	8	@	15
Blue, Chinese	35	@	40
Blue, Prussian.....	20	@	45
Blue, Ultramarine.....	12	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18½
Sienna, Raw.....	7	@	14
Sienna, Burnt.....	7	@	14
Umber, Raw.....	7	@	10
Umber, Burnt.....	7	@	10

Putty—

In barrels and ½ bbls.....	.01½	@	.01¾
In tubs.....	.01⅝	@	.01¾
In tin cans.....	.01½	@	.02½
In bladders..	.01⅞	@	.02½

Spirits Turpentine—

In regular bbls.....	..	@	29½
In machine bbls.....	..	@	30

Glue—

Low Grade.....⅋ ℔	8	@	10
Cabinet	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	10	@	22
English.....	10	@	18
Irish.....	12	@	..

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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CURRENT METAL PRICES.

AUGUST 2, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron:
¾ to 2 in. round and square.. } ℔ lb 1.80 @ 1.90¢
1 to 6 in. x ⅜ to 1 in... .....
Refined Iron:
¾ to 2 in. round and square. }
1 to 4 in. x ⅜ to 1½ in.... ... } ℔ lb 1.90 @ 2.00¢
4½ to 6 in. x ⅜ to 1 in. ....
1 to 6 in. x ¼ and 5-16.....℔ lb 2.10 @ 2.20¢
Rods—⅝ and 11-16 round and sq. ℔ lb 2.00 @ 2.10¢
Bands—1 to 6 x 3-16 to No. 12....℔ lb 2.20 @ 2.30¢
"Burden Best" Iron, base price. ℔ lb.... ...3.00¢
Burden's "H. B. & S." Iron, base price..... ....℔ lb.. .....2.80¢
"Ulster"..... ....℔ lb.....3.00¢
Norway Bars..... .....3.75 @ 4.00¢
Norway Shapes... .....4.50 @ 5.00¢

Merchant Steel from Store—

	Per lb
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots.....	2½¢
Best Cast Steel, base price in small lots.	8 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Sheet Iron from Store—

Black—

	Common American.	R. G. Cleaned American.
Nos. 10 to 16..... ...℔ lb 2¾ @		3¼¢
17 to 20.....℔ lb 3 @ ...		3¼¢
21 to 24.....℔ lb 3¼ @		3½¢
25 and 26. ...℔ lb 3⅝ @		3⅝¢
27.... .....℔ lb 3½ @		3¾¢
28.....℔ lb 3⅝ @		3⅞¢
American B. B.....℔ lb 4¢ @ 4½¢		

Russia, Planished, &c.

Genuine Russia, according to assortment..... .....℔ lb 12¢ @ 13¢
Patent Planished .....℔ lb A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ lb, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16..... .....℔ lb	4¢
17 to 22..... .....℔ lb	4¼¢
23 to 24.....℔ lb	4½¢
25 to 26.. .....℔ lb	4¾¢
27..... .....℔ lb	5 ¢
28... .....℔ lb	5¼¢
29 to 30. .....℔ lb	6¼¢

English Steel from Store—

Best Cast..... .....℔ lb 15 ¢
Extra Cast.....℔ lb 16½ @ 17 ¢
Swaged, Cast..... .....℔ lb 16 ¢
Best Double Shear .....℔ lb 15 ¢
Blister, 1st quality..... .....℔ lb 12 ¢
German Steel, Best.....℔ lb 10 ¢
2d quality.....℔ lb 9 ¢
3d quality.....℔ lb 8 ¢
Sheet Cast Steel, 1st quality..... ....℔ lb 15 ¢
2d quality.....℔ lb 14 ¢
3d quality.....℔ lb 12½¢
R. Mushet's "Special".....℔ lb 48 ¢
" " " Annealed.....℔ lb 75 ¢
" " "Titanic" ....℔ lb 20 ¢

METALS—

Tin—

	Per lb
Banca, Pigs	20½¢ @ 21¢
Straits, Pigs.....	..21¢
Straits in Bars.....	..22¢

Tin Plates—

Duty: 2.2¢ ℔ lb.

Charcoal Plates—Bright—

Guaranteed Plates command special prices, according to quality. Per box.

Melyn and Calland Grade.	IC,	10 x14..	@	$6.50
" " "	IC,	12 x12..	@	6.75
" " "	IC,	14 x20..	@	6.50
" " "	IC,	20 x28..	@	13.00
" " "	IX,	10 x14..	@	8.50
" " "	IX,	12 x12..	@	8.75
" " "	IX,	14 x20..	@	8.50
" " "	IX,	20 x28..	@	17.00
" " "	DC,	12½x17..	@	6.00
" " "	DX	12½x17..	@	8.00
Allaway Grade.....	IC,	10 x14..	@	6.00
" "	IC,	12 x12..	@	6.25
" "	IC,	14 x20..	@	6.00
" "	IC,	20 x28..	@	12.00
" "	IX,	10 x14..	@	7.50
" "	IX,	12 x13..	@	7.75
" "	IX,	14 x20..	@	7.50
" "	IX,	20 x28..	@	15.00
" "	DC,	12½x17..	@	5.50
" "	DX,	12½x17..	@	7.00

Coke Plates—Bright—

Steel Coke.—IC,	10 x 14, 14 x 20..	$5.40	@	$5.50
	10 x 20..	...	@	8.50
	20 x 28..	11.50	@	12.00
IX,	10 x 14, 14 x 20..	....	@	7.00
BV Grade.—IC,	10 x 14, 14 x 20..	....	@	5.60

Charcoal Plates—Terne—

Guaranteed Plates command special prices according to quality.

Dean Grade.—IC,	14 x 20.....	....	@	$5.65
	20 x 28.....	....	@	11.00
IX,	14 x 20.....	....	@	6.40
	20 x 28.....	....	@	12.80
Abecarne Grade.—IC,	14 x 20...	....	@	5.55
	20 x 28....	....	@	10.80
IX	14 x 20....	....	@	6 40
	20 x 28....	....	@	12.80

Tin Boiler Plates—

IXX,	4x 26.....112 sheets.....	@	$13.35
IXX,	14 x 28.....112 sheets.....	@	14.50
IXX,	14 x 31.....112 sheets	@	16.00

American Terne Plates.—Apollo.

IC, 14 x 20.....	$6.25
IC, 20 x 28.....	12.50
IX, 14 x 20.....	7.25
x	14.50

Copper—

Duty: Pig, Bar and Ingot, 1¼¢; Old Copper, 1¢ ℔ lb. Manufactured (including all articles of which Copper is a component of chief value), 35% ad valorem.

Ingot—

Lake.. .... @	11 ¢
Ansonia grade Arizona..... .. @	10½¢
Ansonia grade Casting..... .. @	10 ¢

Sheet and Bolt—

Prices adopted by the Association of Copper Manufacturers of the United States, May 19, 1892. Subject to a discount of 15% @ 25%, according to size of order.

Not wider than	Not longer than	And longer than	Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
			Weights per sq. foot and prices per pound.							
30	72		22	22	22	23	24	25	28	30
30		72	22	22	22	23	25	27	31	....
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	...
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	..	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	....	....	....	....	....
84	96		23	24	....	..	....	....	....	....
84		96	24	25	....	....	....	....	..	....
Ov'r 84 in. wide			25	27	....	....	....	....	....	....

Bolt Copper, ⅝ inch diameter and over, per pound..... 22¢
Circles, Segments and Pattern Sheets, 60 in. diameter and less, 3¢ ℔ lb advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 60 in. diameter, up to 96 in. diameter inclusive, 4¢ ℔ lb advance over prices of Sheet Copper required to cut them from.
Circles, Segments and Pattern Sheets, over 96 in. diameter, 5¢ ℔ lb advance over prices of Sheet Copper required to cut them from.
Cold or Hard Rolled Copper 14 oz. ℔ square foot and heavier, 1¢ ℔ lb over the foregoing prices.
Cold or Hard Rolled Copper lighter than 14 oz. ℔ square foot, 2¢ ℔ lb over the foregoing prices.
All Polished Copper over 20 in. wide, 2¢ ℔ lb advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

	Per lb.
14 ounce to square foot and heavier.....	26¢
12 ounce and up to 14 ounce to square foot...	27¢
10 ounce and up to 12 ounce.....	29¢
Lighter than 10 ounce.....	32¢

Circles less than 8 inches diameter, 2¢ ℔ lb additional.
Circles over 13 inches diameter are not classed as Copper Bottoms.
15% @ 25% discount, according to size of order.

Copper Wash Bowl Bottoms—

Tinned.....℔ lb 34¢, 15% @ 25%

Tinning—

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each.....	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each.....	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.), each.....	12¢
Tinning sheets on one side, other sizes, per square foot.....	2½¢

For tinning both sides double the above prices.

Planished Brass and Copper—

Not larger than 30 x 60.

16 oz. and heavier. ....℔ lb	24¢
14 oz..... .....℔ lb	25¢
12 oz. ....℔ lb	27¢

Seamless Brass Tubes—

July 6, 1892. Net.

O. G.	N. G.	⅜	½	⅝	¾	⅞	1	1½
8-14	6-12	32	28	25	24	23	22	19
15	13	33	28	26	25	24	23	20
16	14	34	29	27	26	25	24	20
17	15	35	30	28	27	26	25	21
18	16	37	31	29	27	26	25	22
19	17	38	32	30	29	28	27	24
20	18-19	39	34	32	31	30	29	26
21	20	41	36	34	33	32	31	29
22	21	43	37	35	34	33	32	31
23	22	45	39	37	36	35	34	34
24	23	48	41	39	38	36	35	36
25	24	51	44	41	40	39	38	40

Copper, Bronze and Gilding Tube, 3¢ ℔ lb additional

Brazed Brass Tubing. (To No. 20 inclusive.)

Above 5-16 inch to 3 inch, inclusive.....	35¢
Plain, above 3 inch.....	45¢
Plain, 5-16 inch.....	45¢
Plain, ¼ inch.....	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch.....	$1.50
Fancy Tubing, Brass, to No. 20, inclusive.....	43¢ ℔ lb
Bronze Tubing, 3¢ ℔ lb more than Brass.	
Discount from list.....	30 @ ..%

Roll and Sheet Brass—

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. 2 / 10	in. 10 / 12	in. 12 / 14	in. 14 / 16	in. 16 / 18	in. 18 / 20	in. 20 / 22	in. 22 / 24
To No. 20, inclusive .	.21	.22	.23	.25	.27	.29	.31	.33
Nos. 21, 22, 23 and 24.	.22	.23	.24	.26	.28	.30	.32	.34
Nos. 25 and 26.....	.22½	.23½	.24½	.27	.29	.31	.33	.35
Nos. 27 and 28.....	.23	.24	.25	.28	.30	.32	.34	.36

Common High Brass: Wider than and including	in. 24 / 26	in. 26 / 28	in. 28 / 30	in. 30 / 32	in. 32 / 34	in. 34 / 36	in. 36 / 38	in. 38 / 40
To No. 20, inclusive..	.36	.39	.42	.46	.50	.55	.60	.65
Nos. 21, 22, 23 and 24	.37	.40	.43	.47	.51	.56	.61	.66
Nos. 25 and 26.....	.38	.41	.44	.48	.52	.57	.63	.71
Nos. 27 and 28.....	.39	.42	.45	.49	.53	.58	.65	.75

Discount from List 15% to 25%.

Brass and Copper Wire—

List January 17, 1884.

Numbered by Stubs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive.....	$0.22	$0.24	$0.26	$0.30
No. 17 and No. 18	.23	.25	.27	.31
No. 19 and No. 20.....	.24	.26	.28	.32
No. 21, or 0.032 diameter	.25	.27	.29	.33

Discount 15% to 25%.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22.....	$0.26	$0.28	$0.30	$0.34
No. 23.....	.28	.30	.32	.36
No. 24.....	.30	.32	.34	.38
No. 25.....	.32	.34	.36	.40
No. 26.....	.35	.37	.39	.43
No. 27.....	.38	.40	.42	.46
No. 28.....	.42	.44	.46	.51
No. 29.....	.45	.47	.49	.54
No. 30.....	.48	.50	.52	.6[illegible]
No. 31.....	.51	.53	.55	.67
No. 32.....	.55	.57	.59	.73
No. 33.....	.59	.61	.63	.82
No. 34.....	.64	.66	.68	.95
No. 35.....	.70	.72	.74	1.30
No. 36.....	.76	.78	.80	1.50
No. 37.....	1.00	1.02	1.04	1.70
No. 38.....	1.30	1.32	1.34	2.00
No 39.....	2.00	2.02	.00	3.25
No. 40....	2.60	2.62	2.60	5.75

— % discount.
Spring Wire, 2¢ ℔ lb advance.

Copper Belt and Hose Rivets and Burrs—

	Per lb.		Per lb
No. 5.....	49¢	No. 11.....	56¢
No. 6.....	49¢	No. 12.....	58¢
No. 7.....	49¢	No. 13.....	60¢
No. 8.....	50¢	No. 14.....	65¢
No. 9.....	52¢	No. 15.....	70¢
No. 10.....	54¢		

60% @ 5% discount.

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.

¼ to 3½ inches inclusive.....17¢ ℔ lb
Over 3½ to 5 inches inclusive.....18¢ ℔ lb

Piston Rods, Finished True, Smooth and Straight.

¼ to 3½ inches inclusive.....18¢ ℔ lb
Over 3½ to 5 inches inclusive .....19¢ ℔ lb

Spelter—

Duty: Pig, Bars and Plates, $1.50 ℔ 100 lb.
Western Spelter..... .....5¢@5¼¢
Bertha (pure)..... ...8¢

Zinc—

Duty: Sheet, 2½¢ ℔ lb.
600 lb casks..... .. ..6¼¢
Per lb.....7 ¢

Lead—

Duty: Pig, $2 ℔ 100 lb. Old Lead, 2¢ ℔ lb. Pipe and Sheets, 2½¢ ℔ lb.

American Pig.....	4¢
Bar.....	4½¢
Pipe, subject to discount 20%.....	6¼¢
Tin-Lined Pipe, subject to discount 20%...	..15¢
Block Tin Pipe, subject to discount 20%.....	37½¢
Sheet, subject to discount 20%.....	....7¢

Old Lead in exchange, 3¼¢ ℔ lb.

Solder—

⅛ @ ⅛ (Guaranteed).....13½¢ @ 15¢
No. 1..... .....11¾¢ @ 12½¢

Prices of Solder indicated by private brands vary according to composition.

Antimony—

Cookson... ... .℔ lb 11 ¢
Hallett's .. ..10½¢

Aluminum—

Duty: 15¢ ℔ lb.

No. 2 grade metal, in to 1 lots..... .....℔ lb	.75
No. 1 (guaranteed to be 98% pure and over), in ton lots..... .....℔ lb	.90
Lots less than 1 ton.....10¢ ℔ lb additional	

Old Metals—

Prices Paid in New York.

Heavy Copper.....	℔ lb 9½¢
Light and Tinned Copper	℔ lb 8½¢
Heavy Brass.....	℔ lb 7 ¢
Light Brass.....	℔ lb 6 ¢
Lead.....	℔ lb 3½¢
Tea Lead.....	℔ lb 3½¢
Zinc.....	℔ lb 2½¢
No. 1 Pewter.....	℔ lb 14 ¢
No. 2 Pewter.....	℔ lb 7 ¢
Wrought Scrap Iron.....	℔ gross ton $13.00
Heavy Cast Scrap	℔ gross ton 9.00
Stove Plate Scrap.....	℔ gross ton 6.00
Burnt Iron.....	℔ gross ton 4.00

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